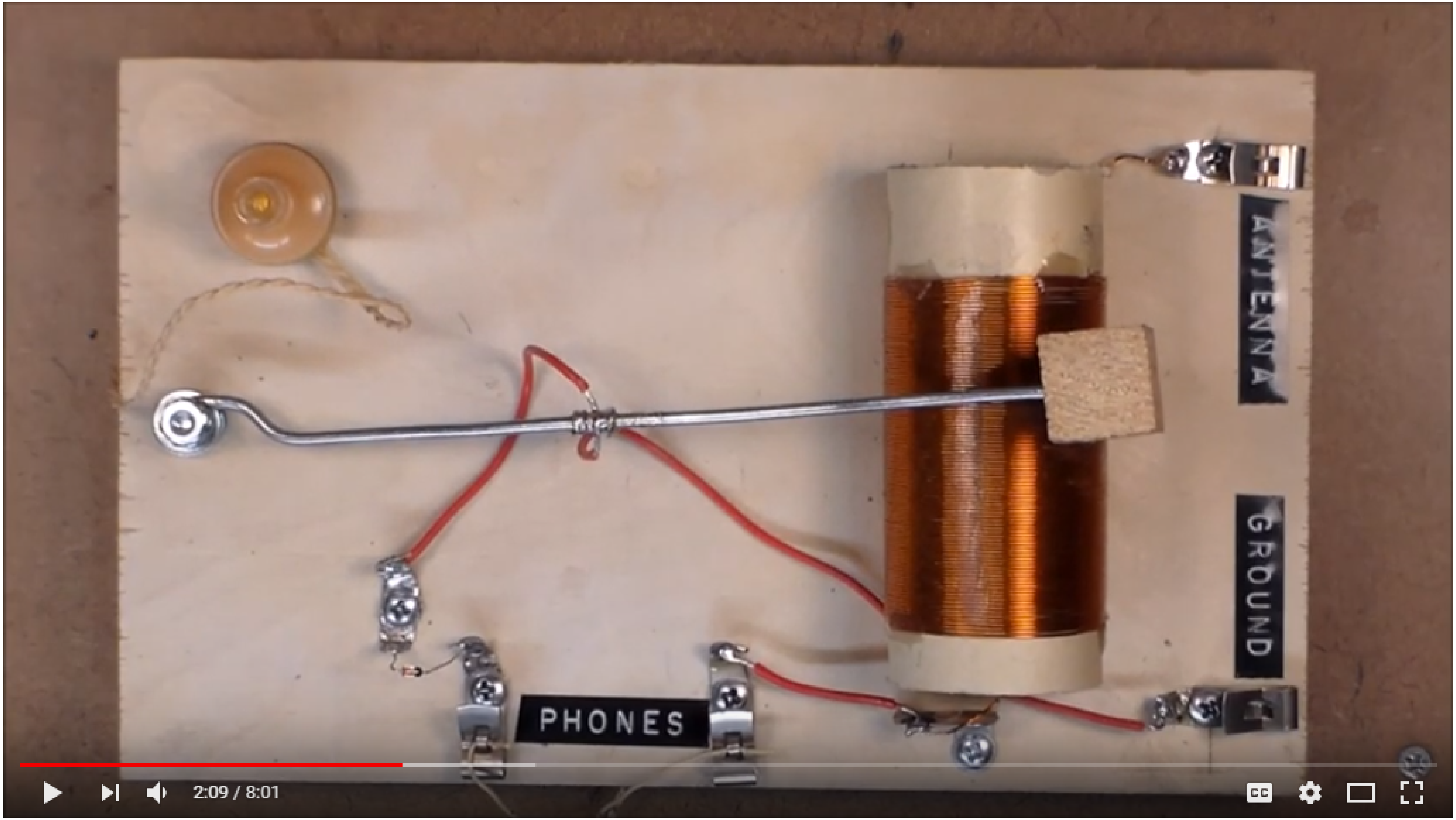
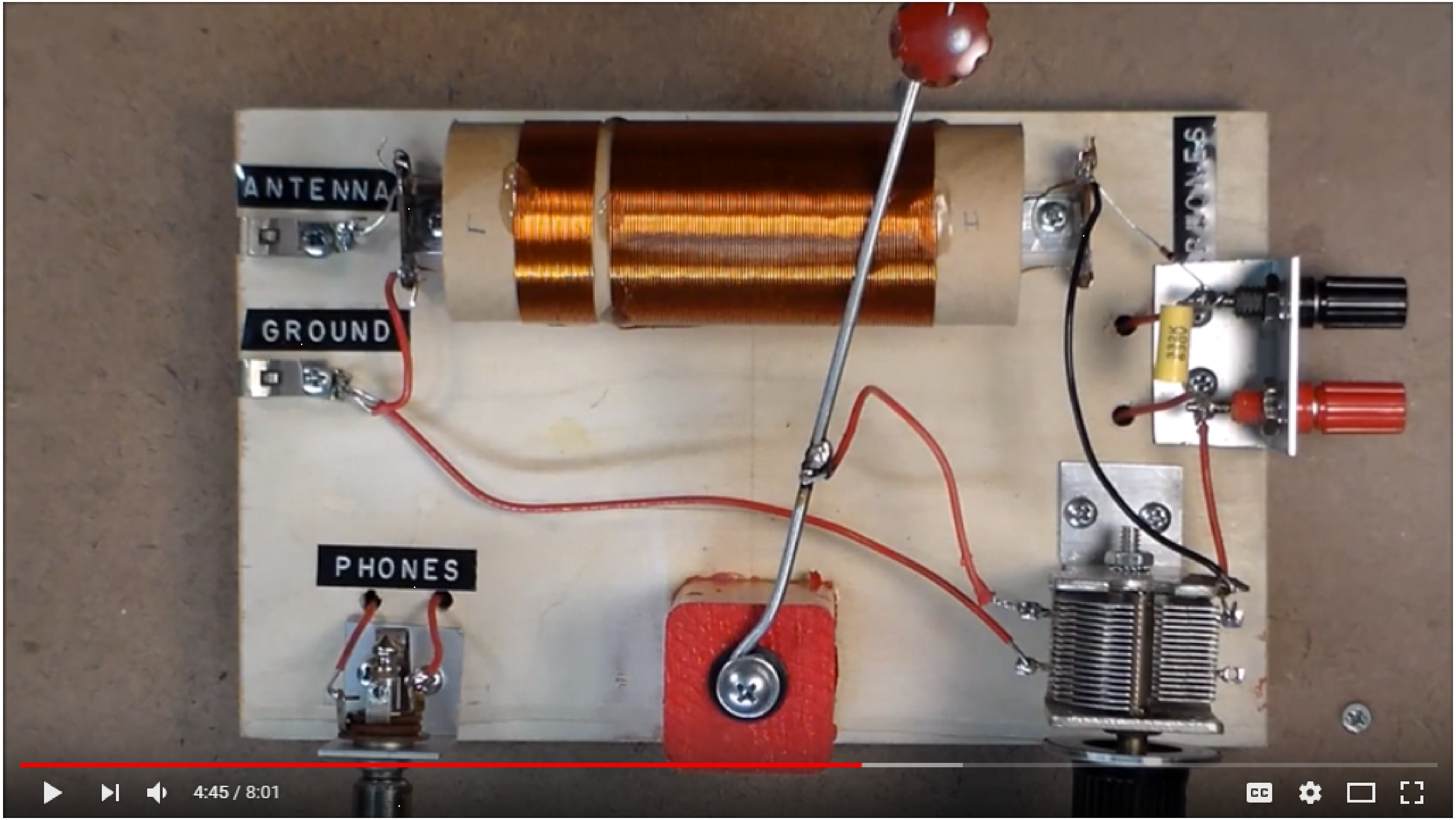
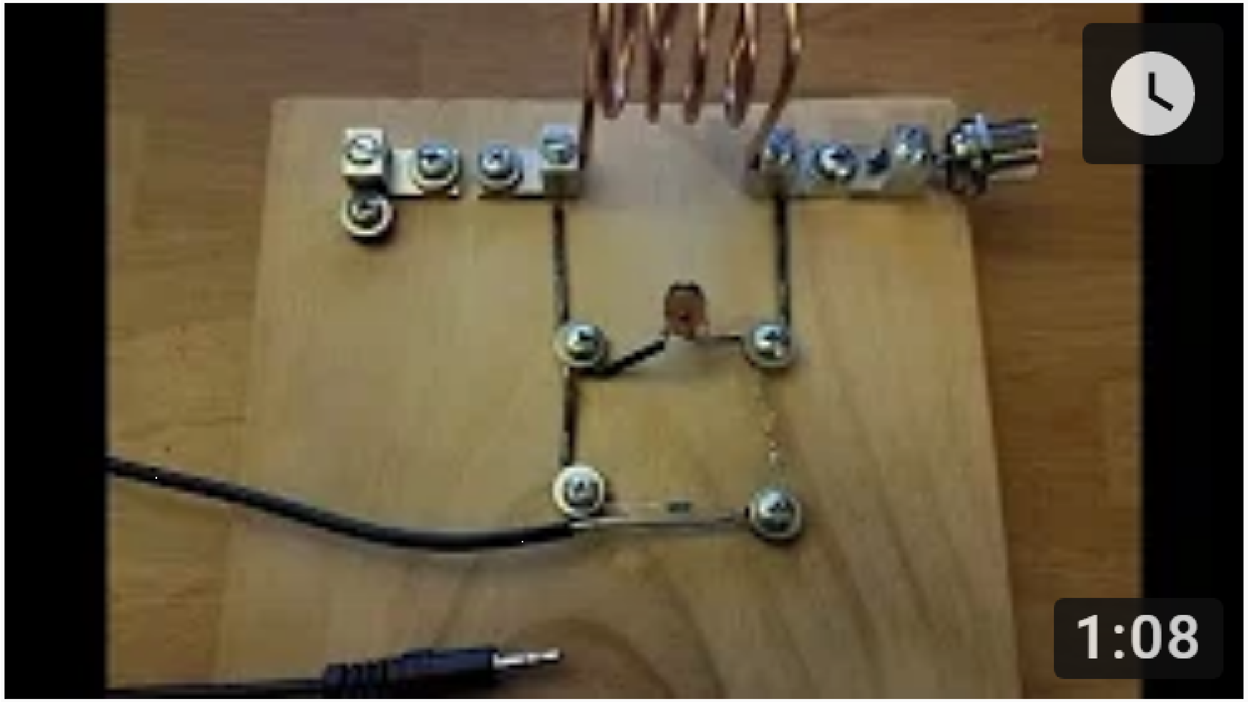


BOY SCOUT CRYSTAL RADIO UPGRADE



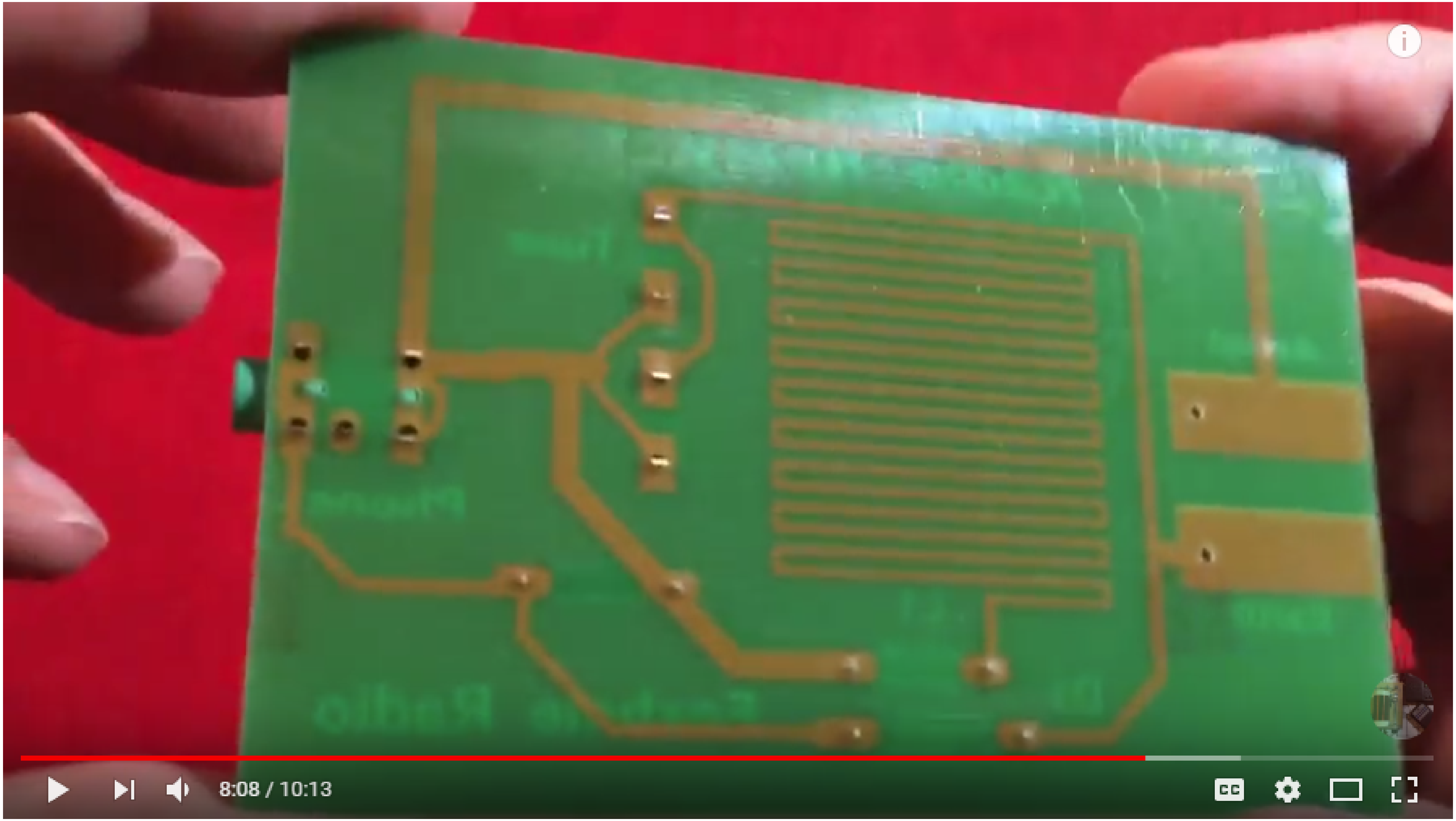
BOY SCOUT CRYSTAL RADIO UPGRADE



Broadcast AM Audio
Reception From My

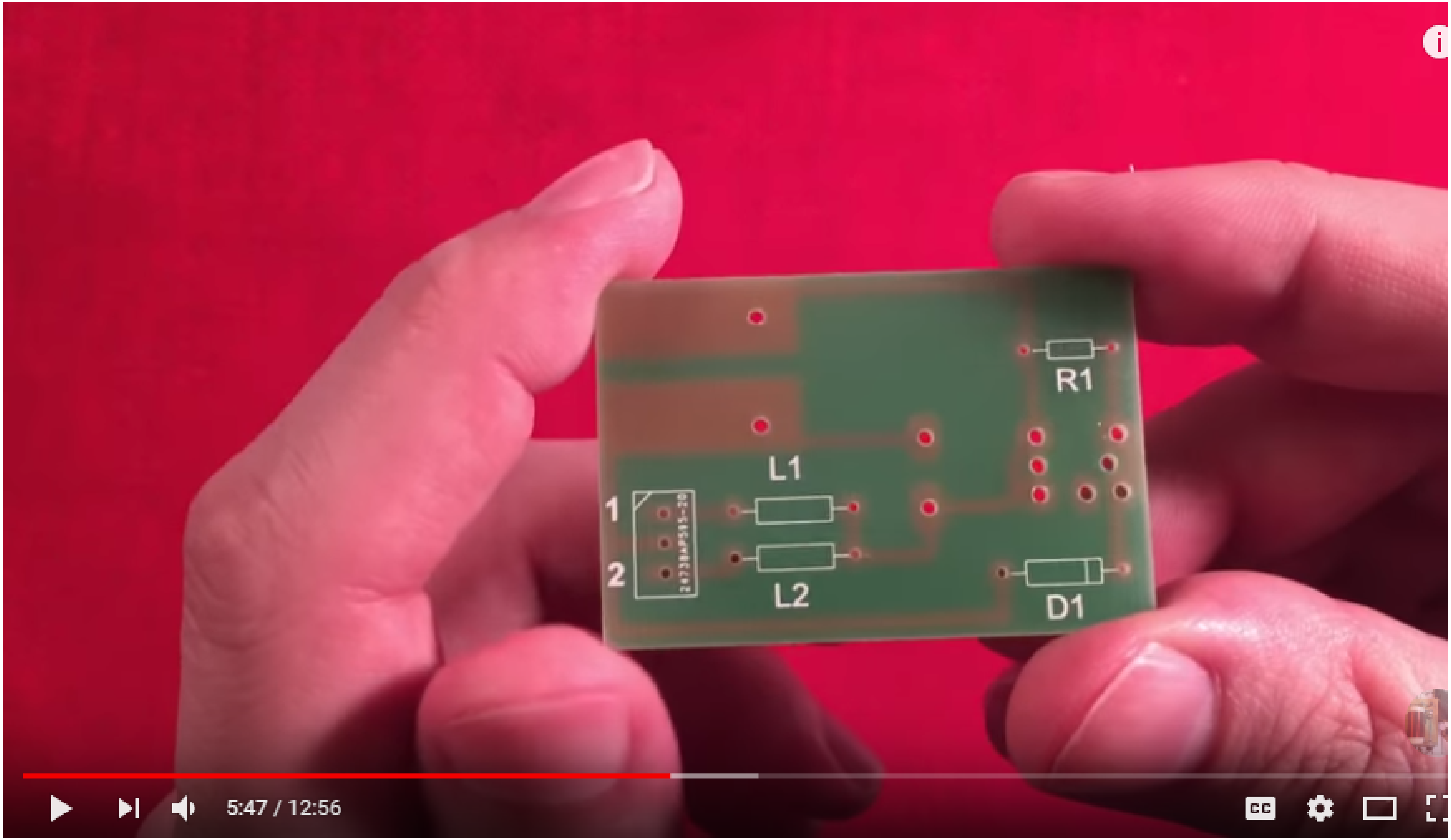
Live CB Radio •
192 views • 9 months ago

I made a primitive crystal rad
connected to a computer run

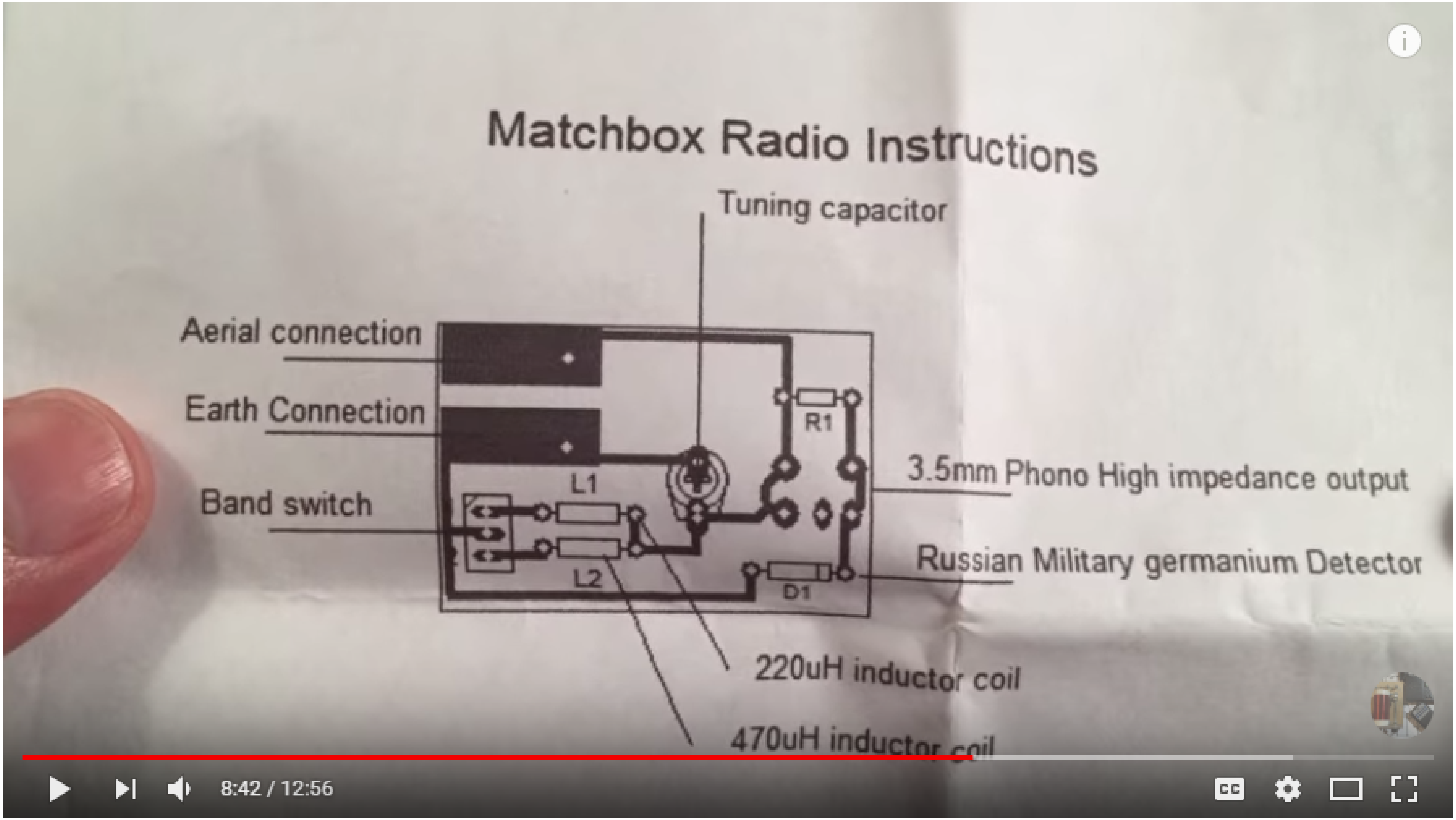


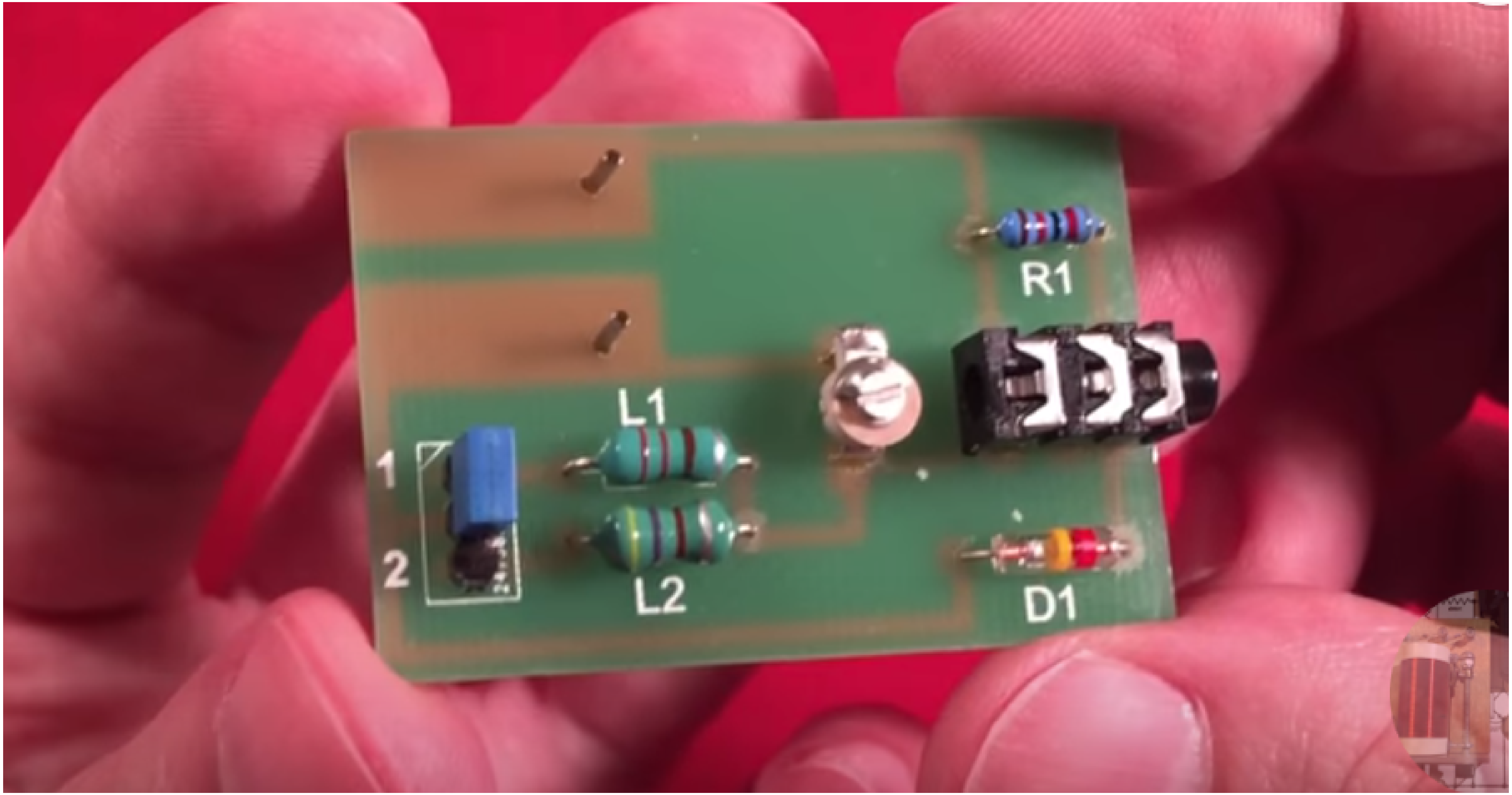
Make: Foxhole Crystal Portable Radio Kit Build & Review

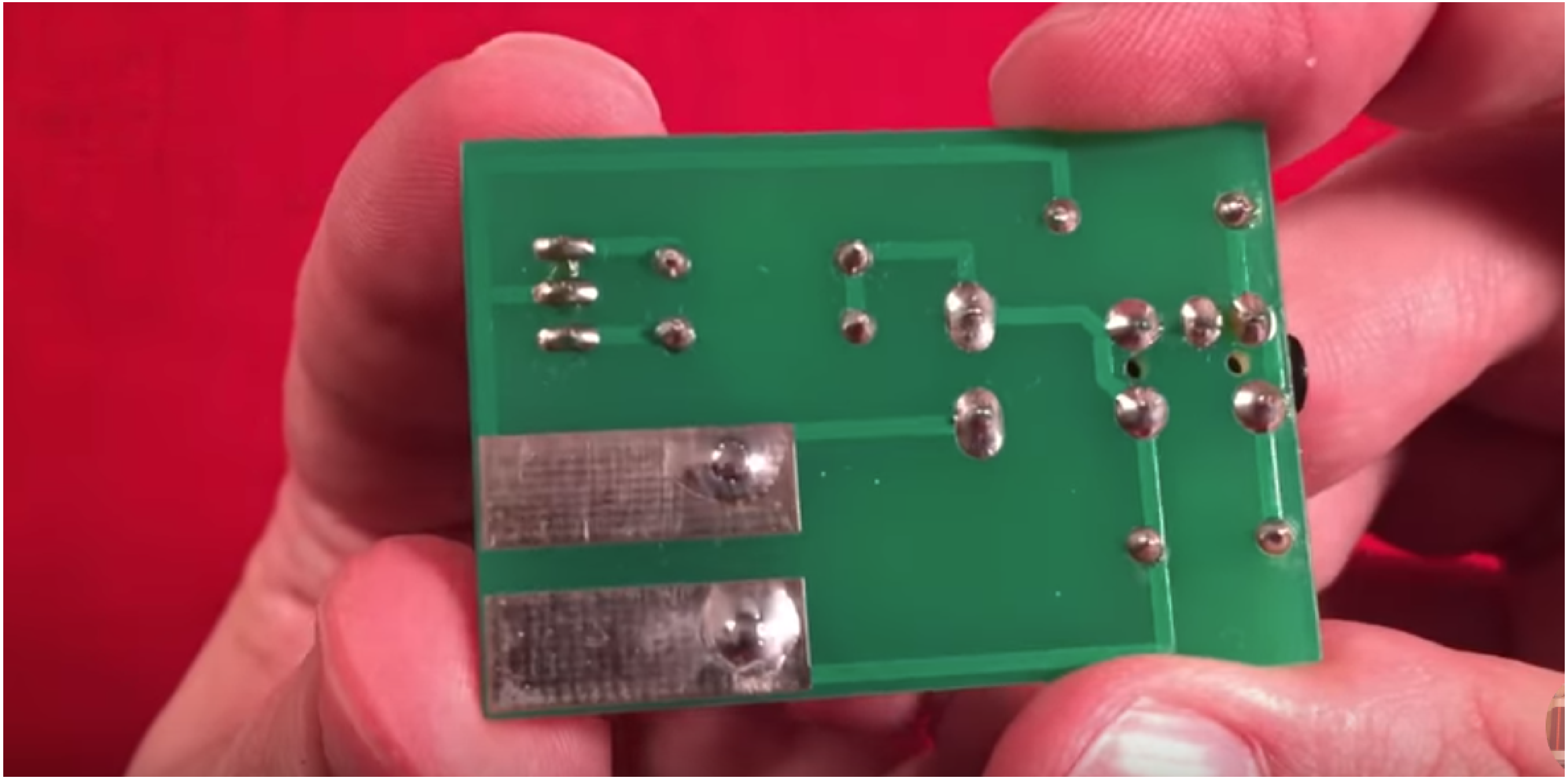
Make: Foxhole Crystal Portable Radio Kit Build & Review

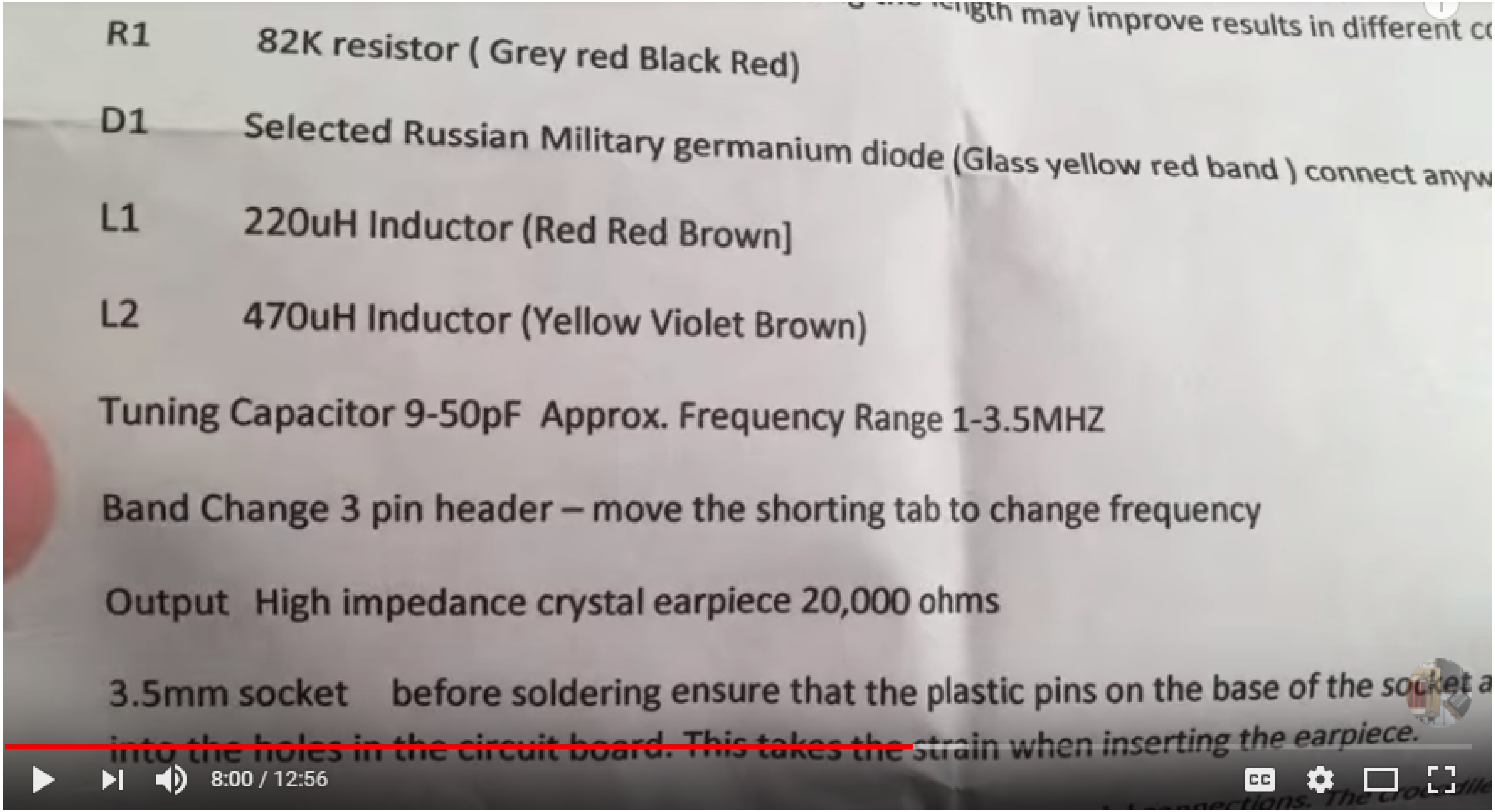


Make: DIY Matchbox Crystal Radio Kit Build and Review


Matchbox Radio Instructions
Tuning capacitor
Aerial connection
Earth Connection
Band switch
L1
L2
R1
D1
3.5mm Phono High impedance output
Russian Military germanium Detector
220uH inductor coil
470uH inductor coil
8:42 / 12:56


R1
L1
1
2
L2
D1




ngth may improve results in different c

R1 82K resistor (Grey red Black Red)

D1 Selected Russian Military germanium diode (Glass yellow red band) connect anyw

L1 220uH Inductor (Red Red Brown]

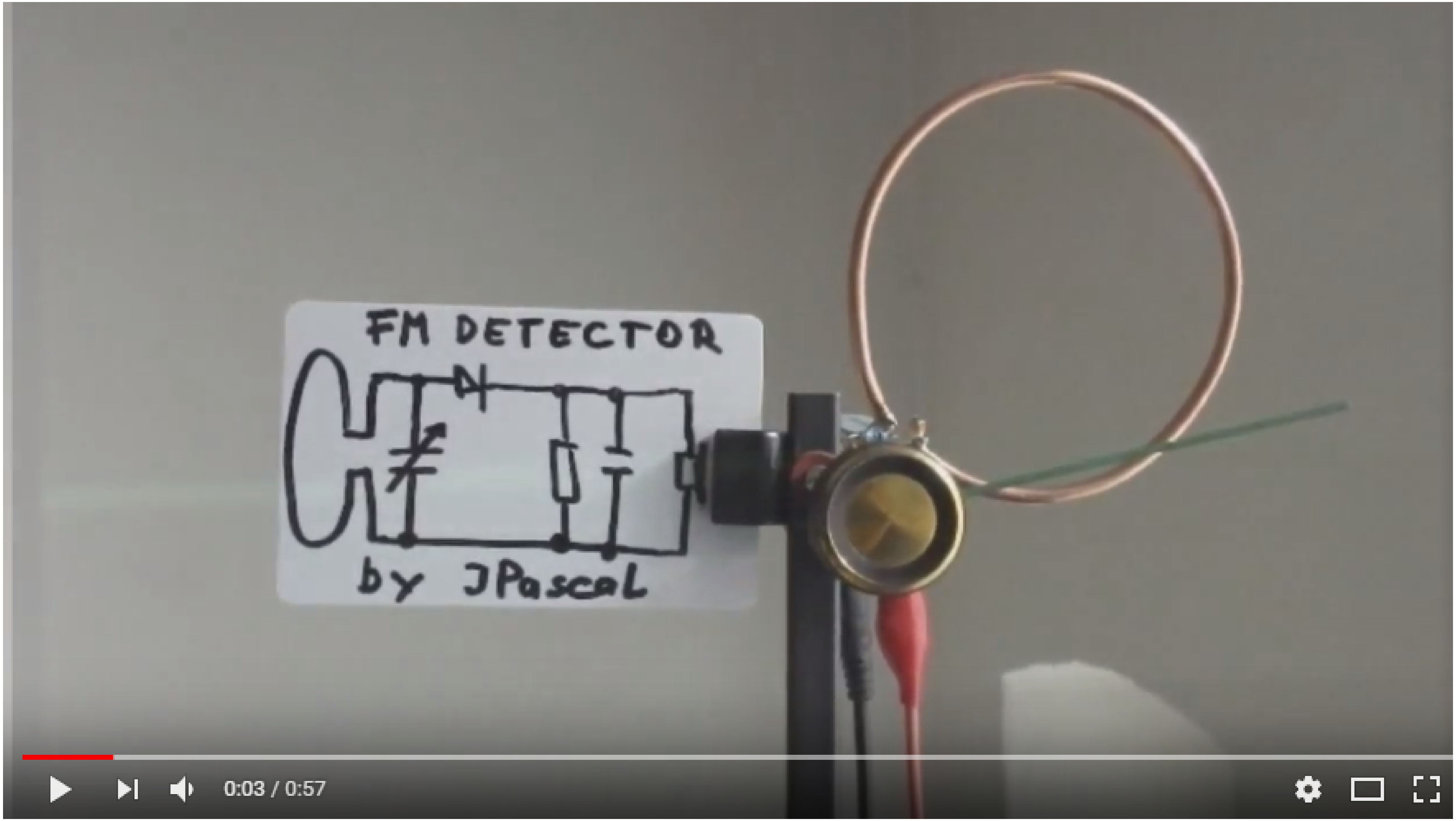
L2 470uH Inductor (Yellow Violet Brown)

Tuning Capacitor 9-50pF Approx. Frequency Range 1-3.5MHZ

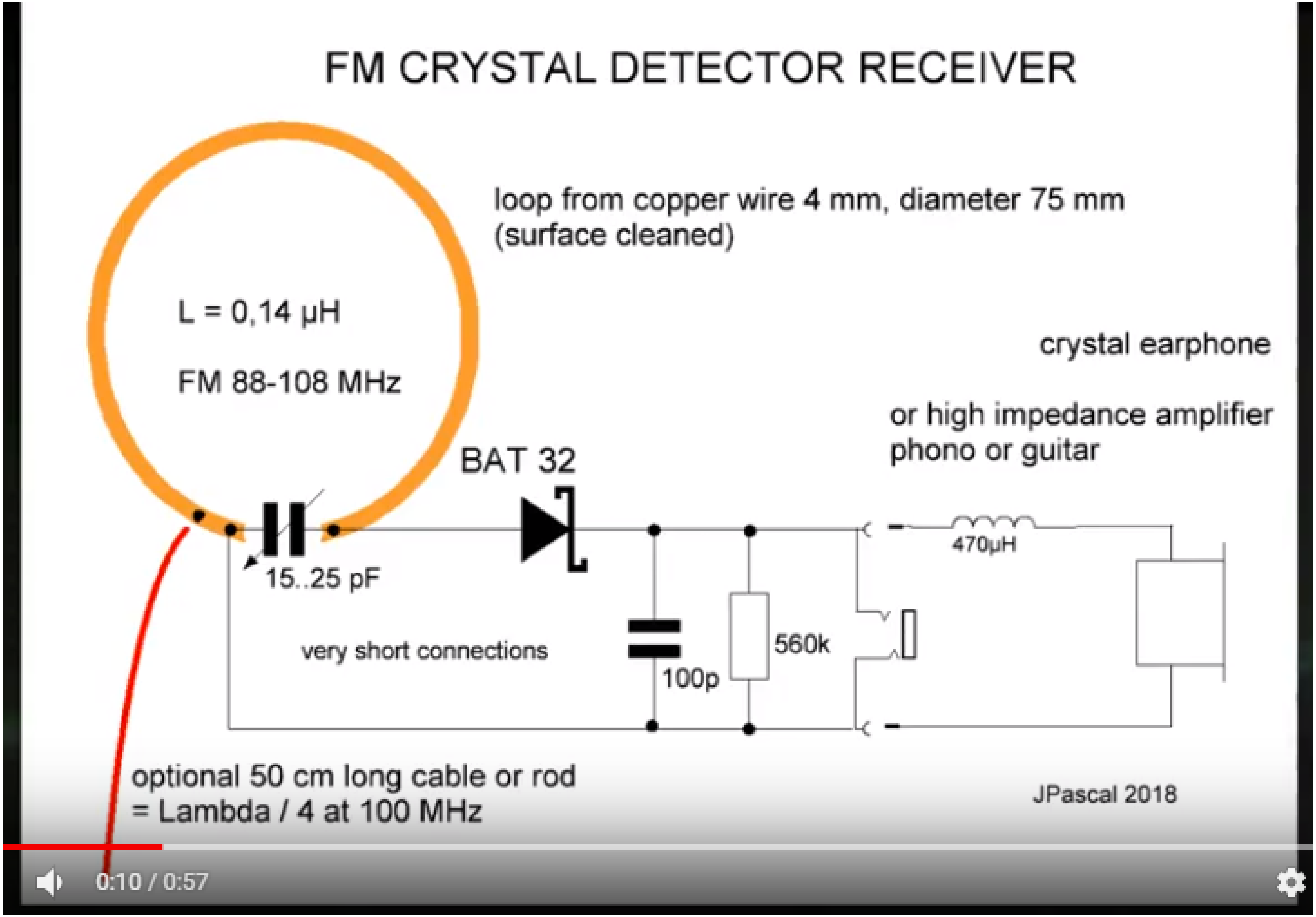
Band Change 3 pin header – move the shorting tab to change frequency

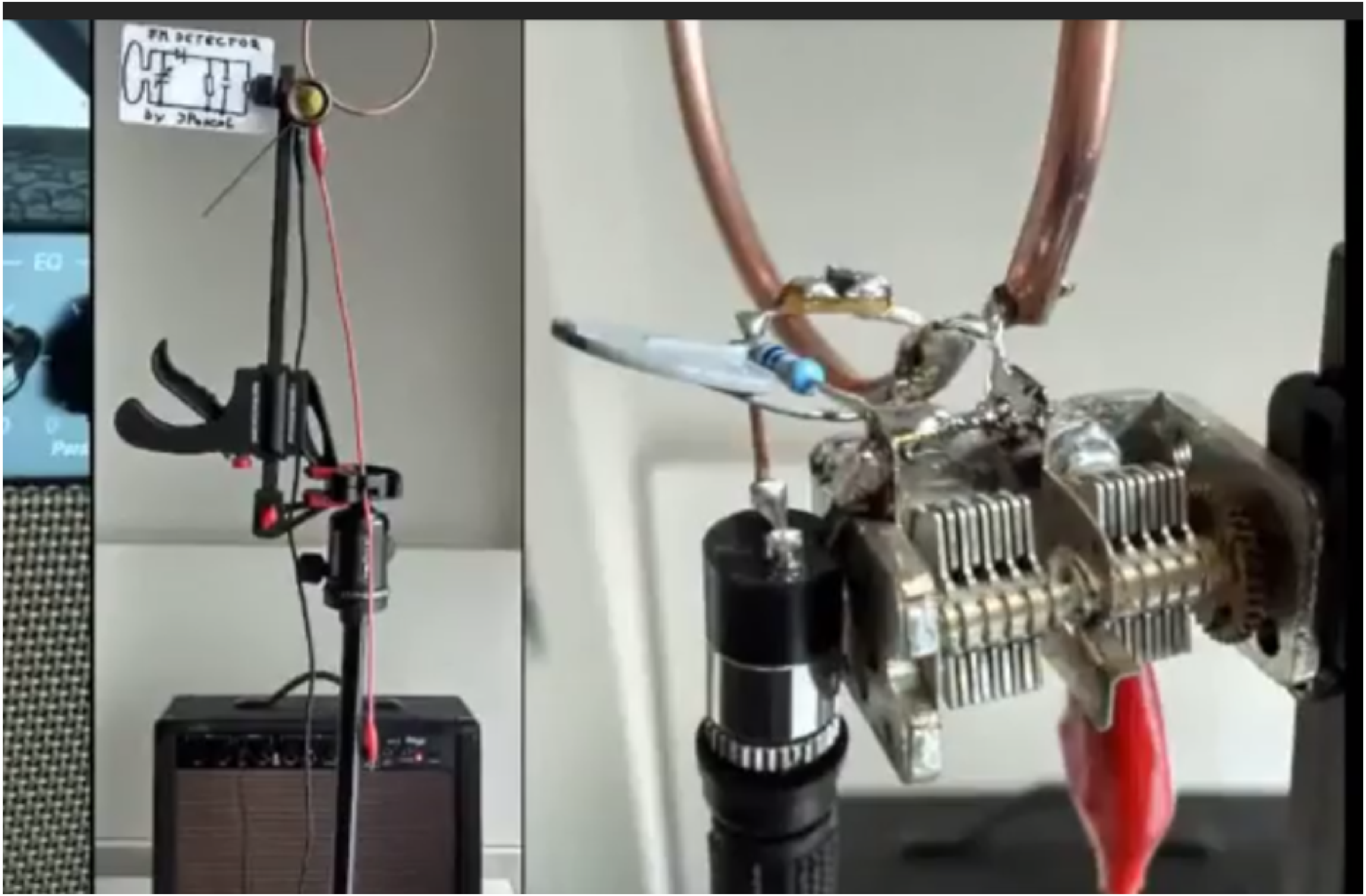
Output High impedance crystal earpiece 20,000 ohms

3.5mm socket before soldering ensure that the plastic pins on the base of the socket a
into the holes in the circuit board. This takes the strain when inserting the earpiece.

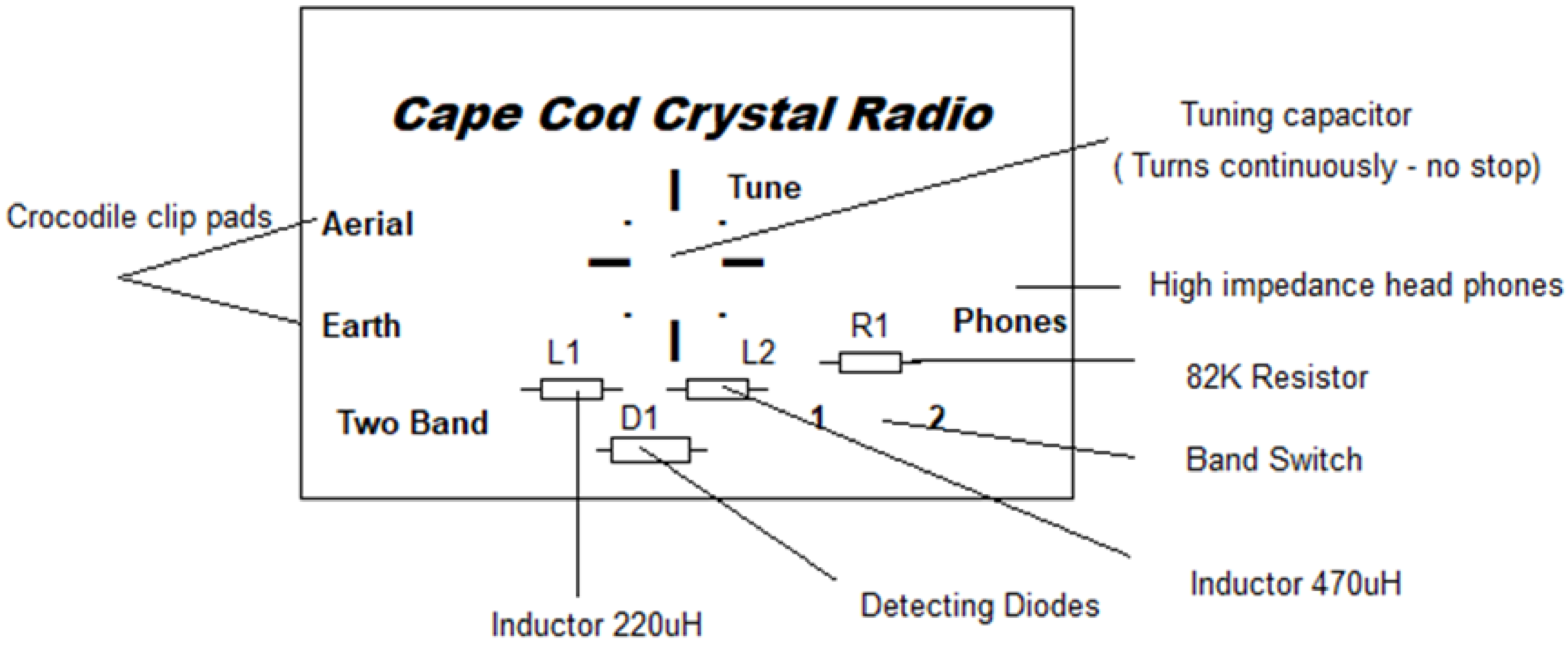


FM Crystal Detector Live Recordings


FM CRYSTAL DETECTOR RECEIVER
loop from copper wire 4 mm, diameter 75 mm
(surface cleaned)
L = 0,14 µH
FM 88-108 MHz
crystal earphone
or high impedance amplifier
phono or guitar
BAT 32
470µH
15..25 pF
very short connections
560k
100p
optional 50 cm long cable or rod
= Lambda / 4 at 100 MHz
JPascal 2018
0:10 / 0:57


FM DETECTOR
EQ


Cape Cod Crystal Radio
Tune
Aerial
Earth
Phones
R1
L1
L2
Two Band
D1



1. Solder D1 the germanium diode. RED band to the right.

2. Solder L1 220uH inductor (Red Red Brown Silver)

3. Solder L2 470uH Inductor (Red Violet Brown Silver)

3. Solder R1 82K ohm resistor (Grey Red Black Red) Above Switch

4. Solder band change switch, make sure it is parallel with the board

5. Solder the 3.5mm earphone socket, ensure it is parallel to the board before you solder and the locating pins align with board holes.

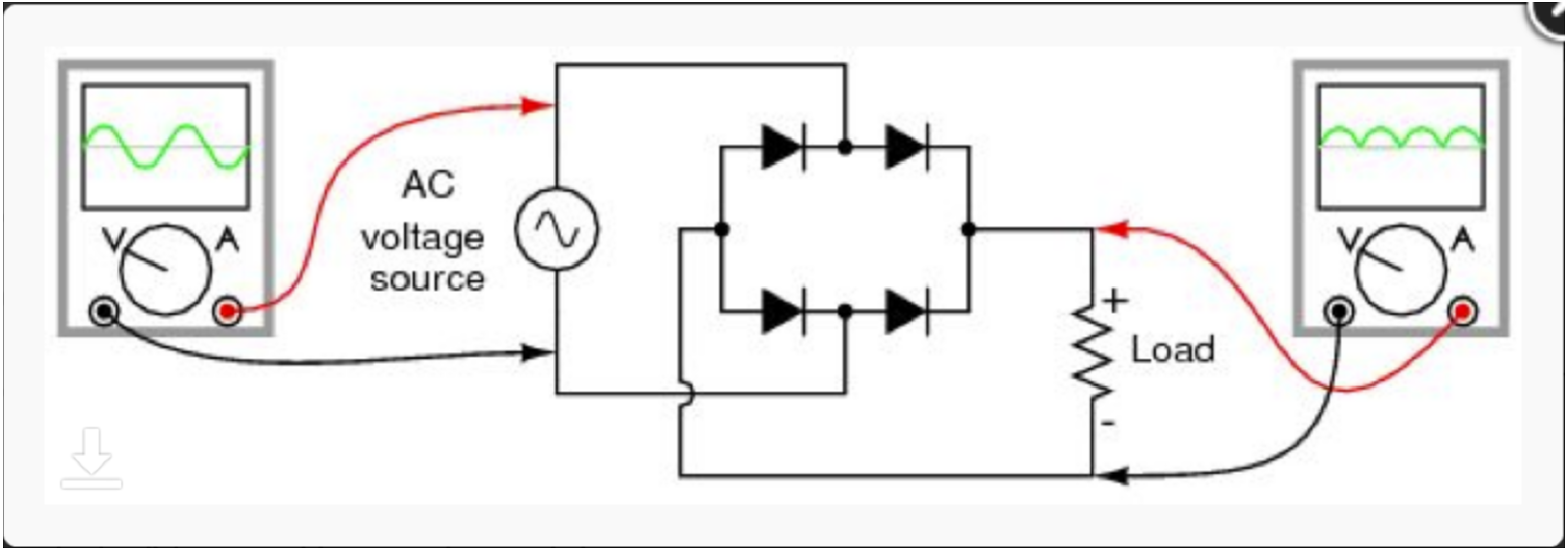
6. Solder the variable capacitor 120pF. Any way it is not polarity sensitive.

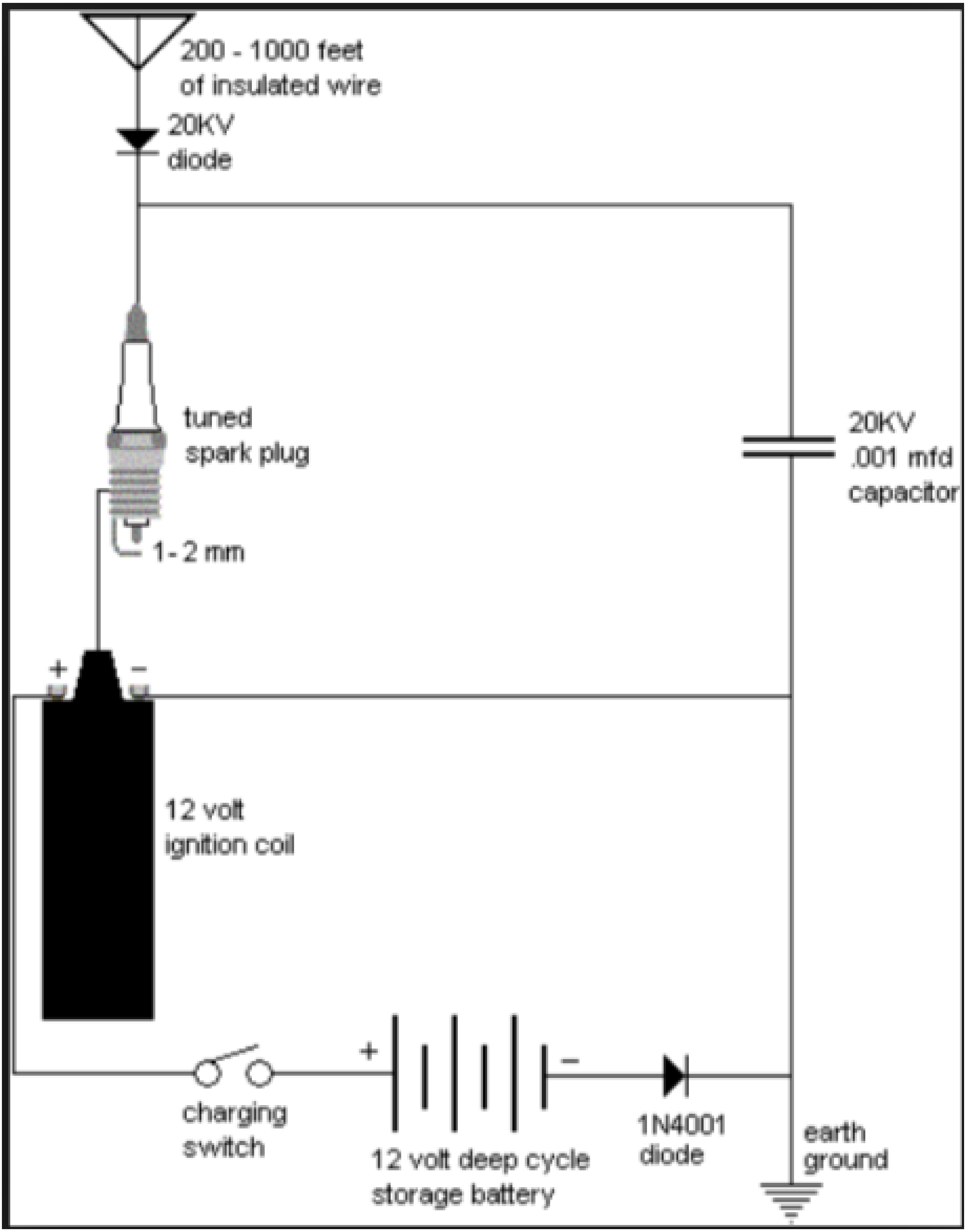
7. Two silver pins are provided for aerial and earth connections,just clip the crocodile clips to these pins or, leave these pins off and connect to the pads on the board. For portable use and younger children best to leave these pins off the board.

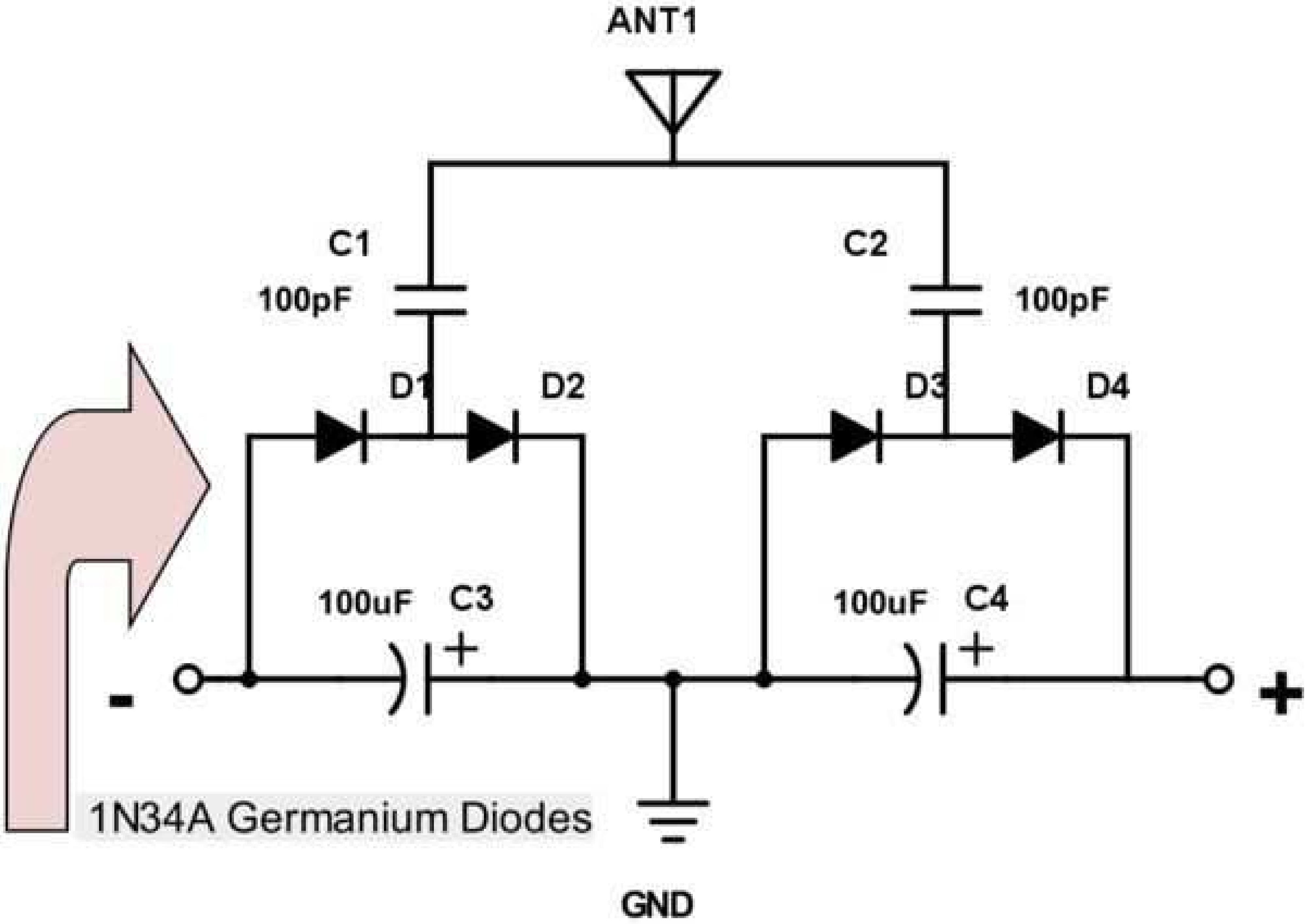
Connect the crocodile clips for the earth and aerial wires. Strip approximately 25mm of the insulation, thread through hole and crimp both the insulated part and the bare wire with pliers.

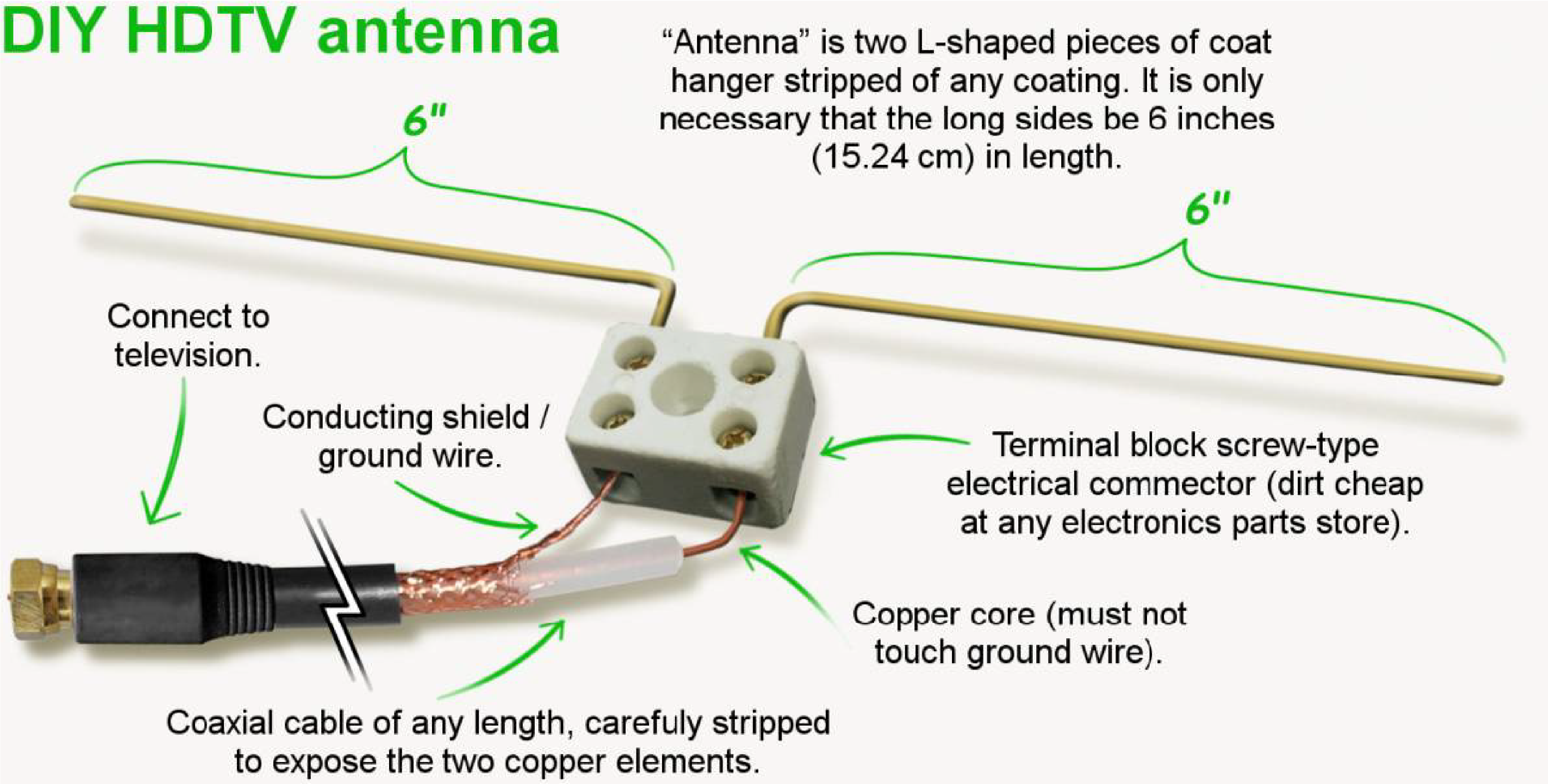
L1 is an inductor, a 220uH coil in series series with L2 a 470uH inductor. The switch shorts out the L2 in ther band 1 position. D1 is a specially selected germanium diode to give optimum performance in this particular circuit. R1 is a 82K resistor across the high impedance output. The variable capacitor is a 9 - 120pF capacitor

Getting Started . Plug the headphones into the socket. Holding your thumb behind the socket when plugging in will avoid any stress on the solder joints.To get the strongest signals in your area you will need to experiment if


V
A
AC
voltage
source
+
Load
-
V
A


200 - 1000 feet
of insulated wire
20KV
diode
tuned
spark plug
1-2 mm
20KV
.001 mfd
capacitor
+
−
12 volt
ignition coil
+
−
charging
switch
12 volt deep cycle
storage battery
1N4001
diode
earth
ground


ANT1
C1
100pF
C2
100pF
D1
D2
D3
D4
100uF
C3
100uF
C4
-
+
1N34A Germanium Diodes
GND


DIY HDTV antenna
"Antenna" is two L-shaped pieces of coat hanger stripped of any coating. It is only necessary that the long sides be 6 inches (15.24 cm) in length.
6"
6"
Connect to television.
Conducting shield / ground wire.
Terminal block screw-type electrical commector (dirt cheap at any electronics parts store).
Copper core (must not touch ground wire).
Coaxial cable of any length, carefuly stripped to expose the two copper elements.

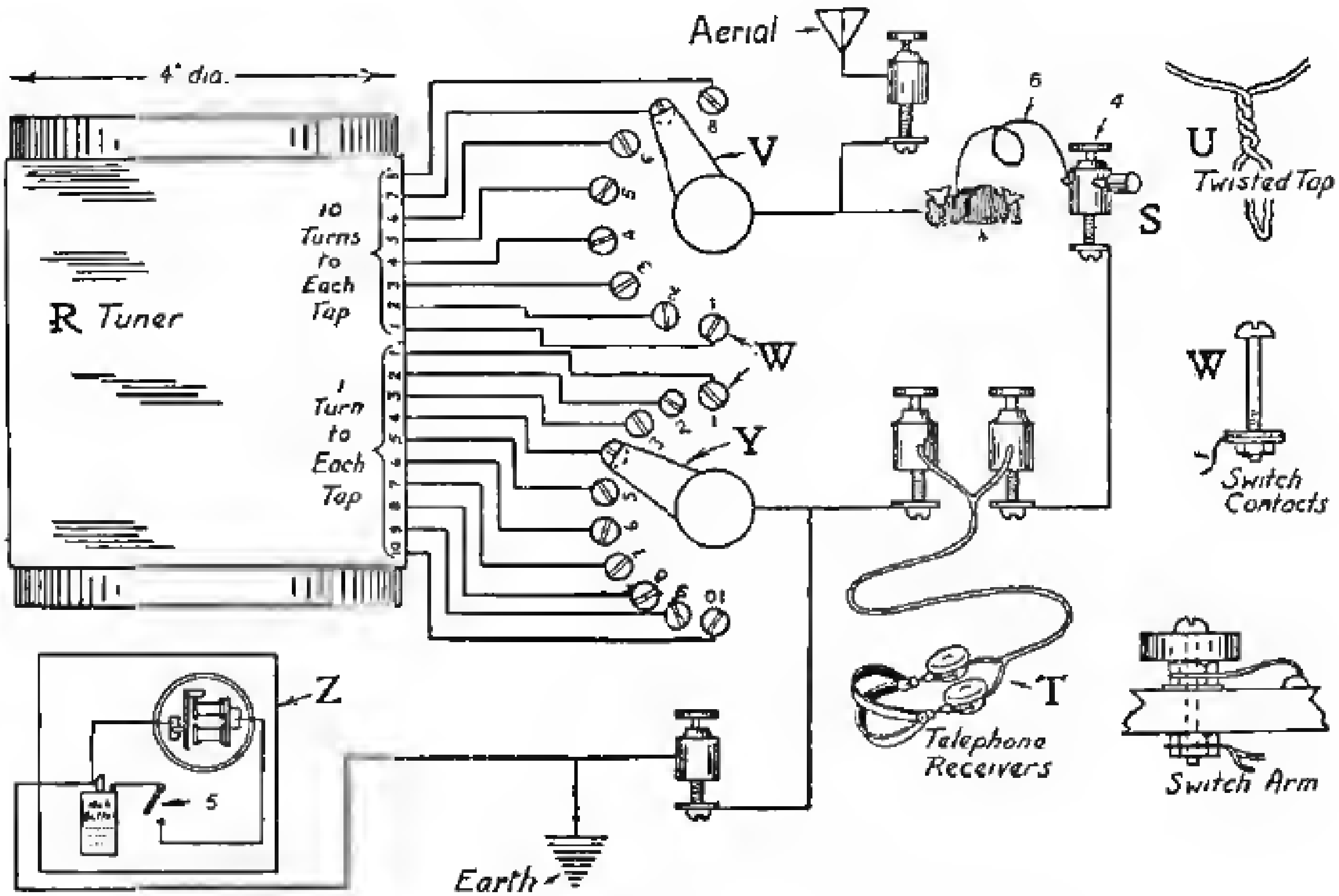


Fig. 3.—The Receiving Set in Complete Detail.

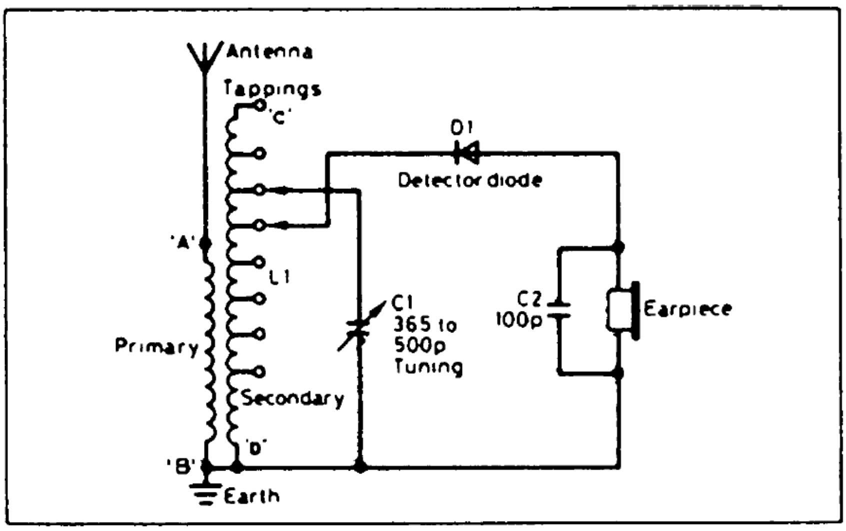


Figure 1 Circuit diagram of the crystal set

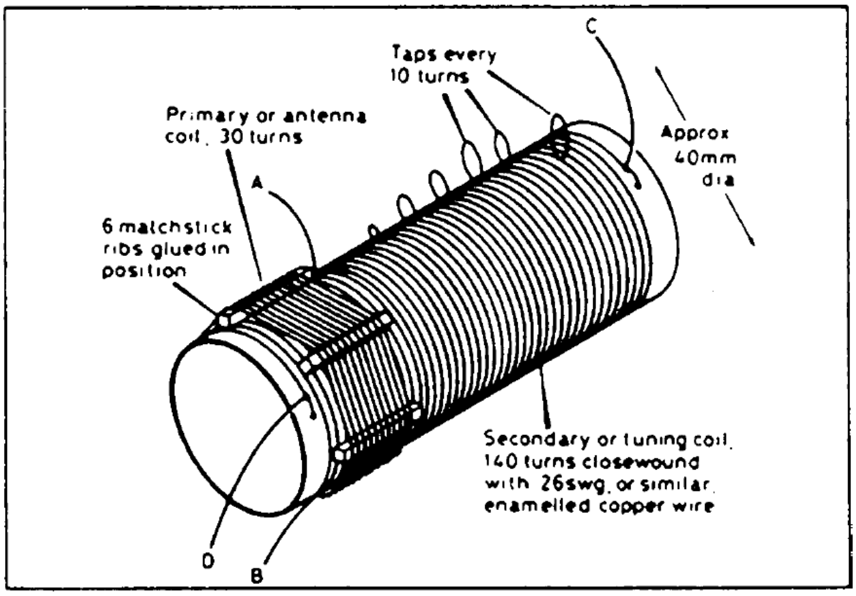


Figure 2 The coil is mounted on a cardboard tube as shown. Exact size is not too important. Try different taps for best results

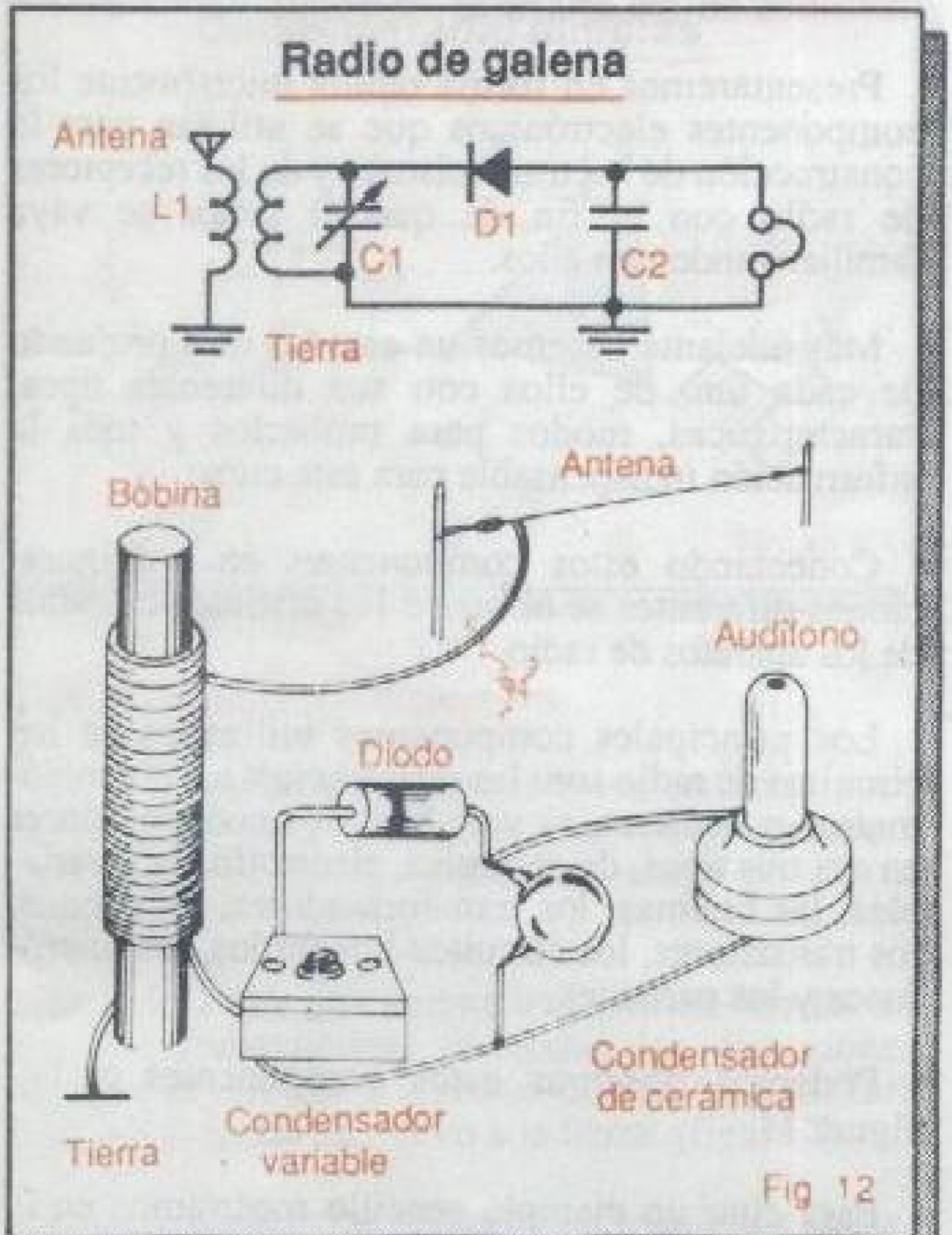


Fig 12

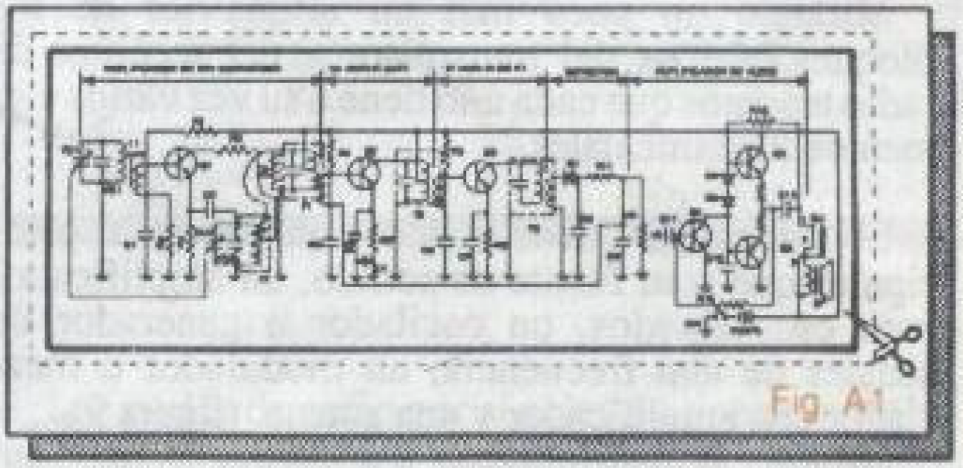


Fig. A1

Paso 2. Pegar la lámina sobre el tablero

Tome su tablero de madera y pegue el esquema sobre él. Unte el pegante en poca cantidad solamente en los bordes y un poco en el centro en forma de cruz. (figura A2).

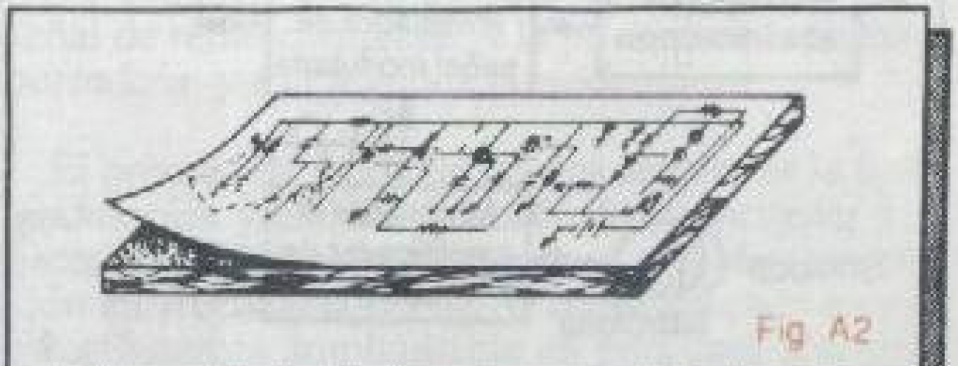
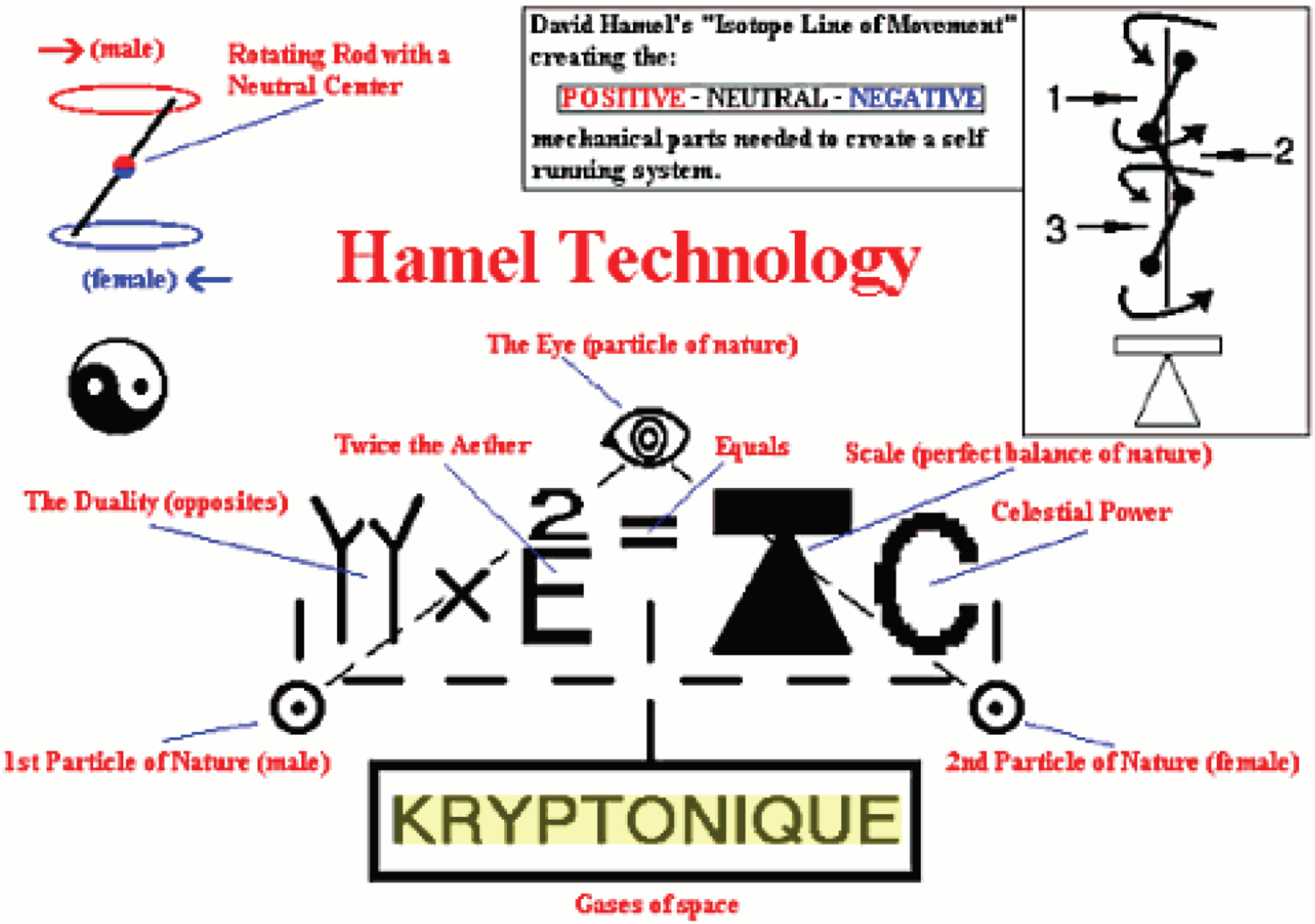
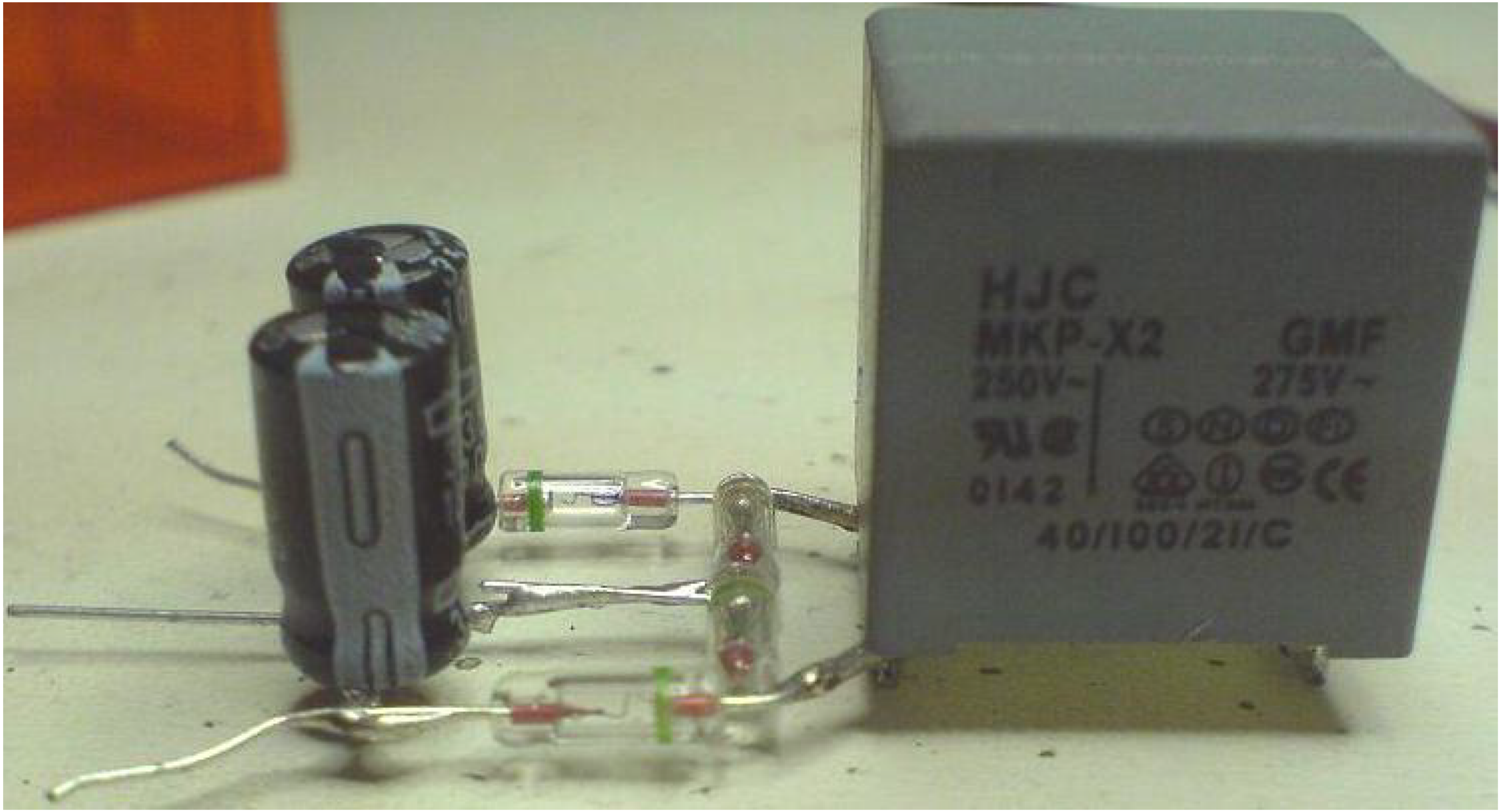


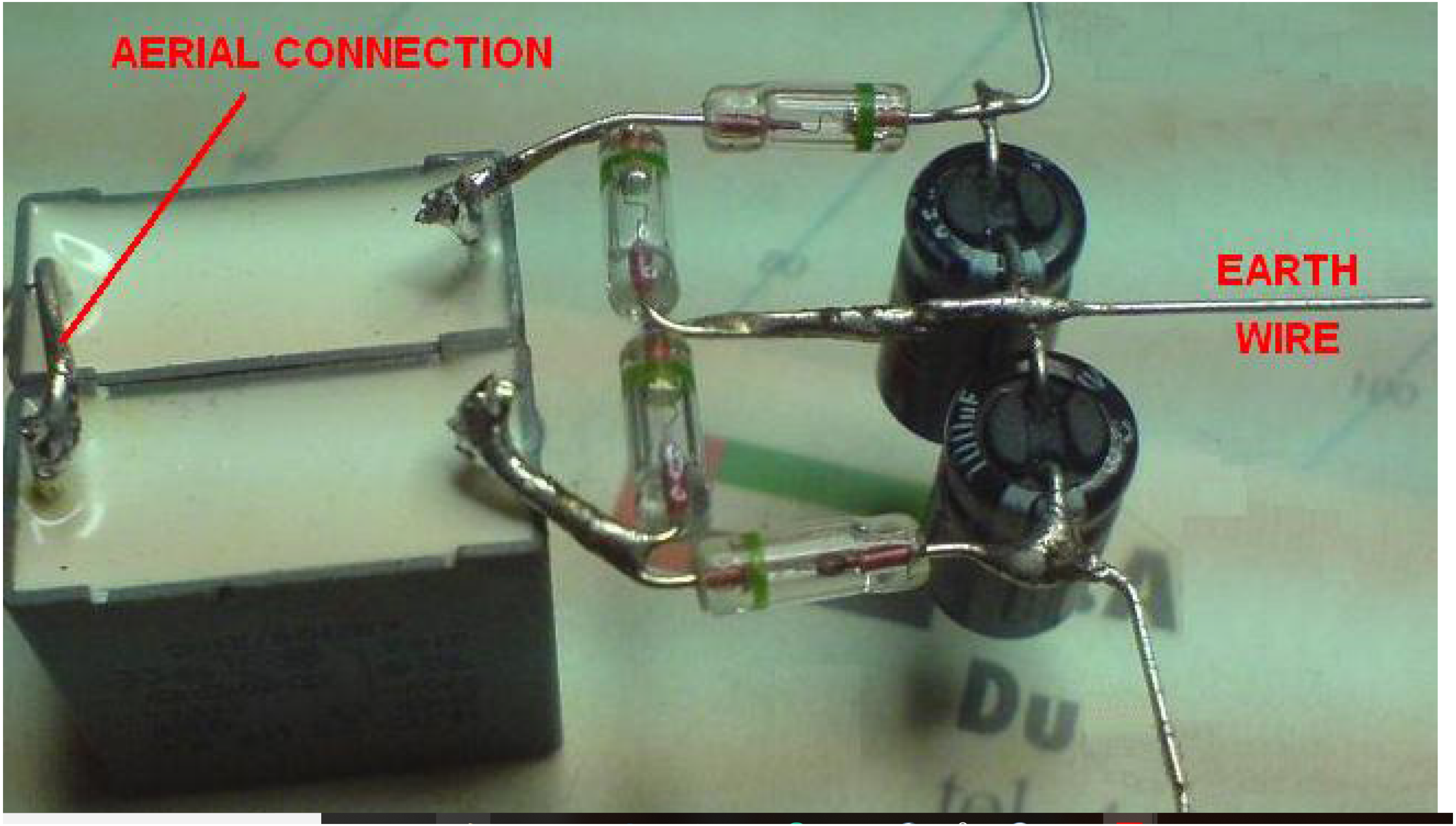
Fig. A2

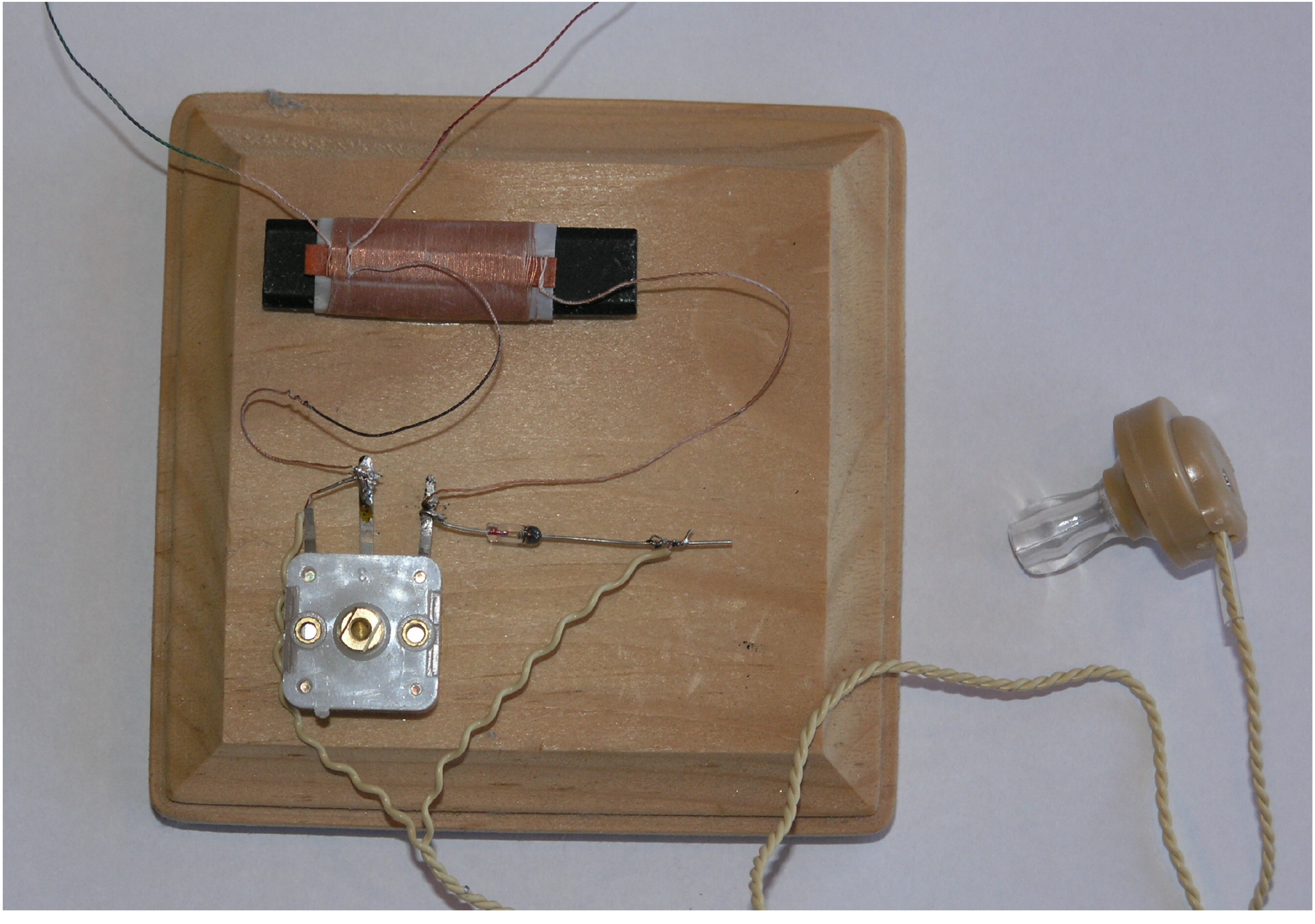
THE LOST HAMEL DRAWINGS:



Particle Structure. [The MOST IMPORTANT Hamel Diagram of All.]


HJC
MKP-X2
GMF
250V~
275V~
0142
40/100/21/C


AERIAL CONNECTION
EARTH
WIRE



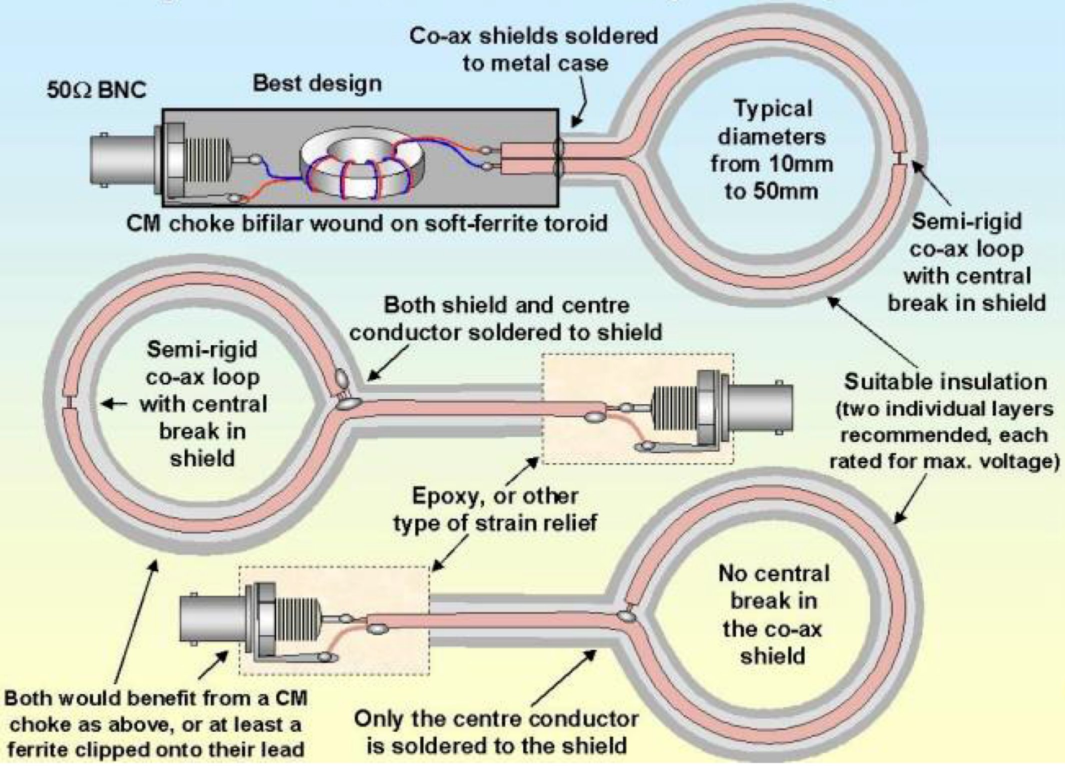


Figure 1 Three constructions for magnetic field probes

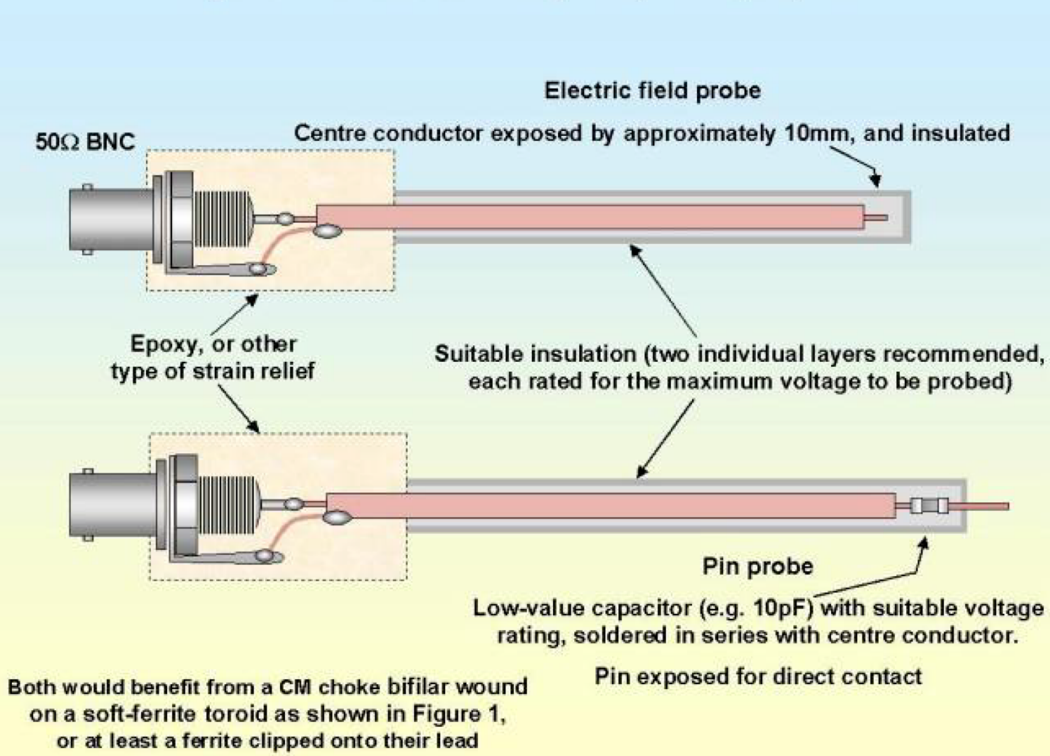
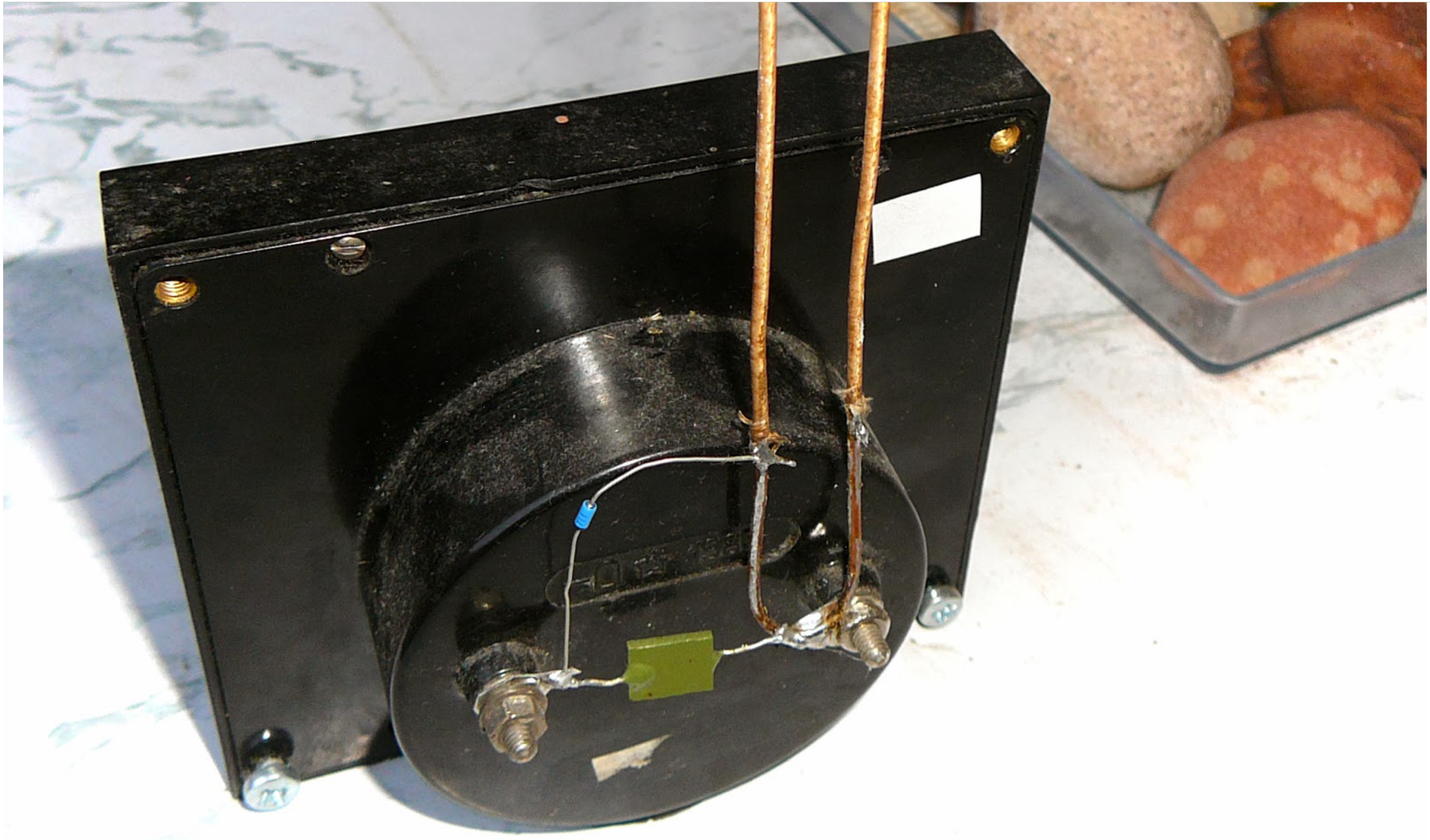
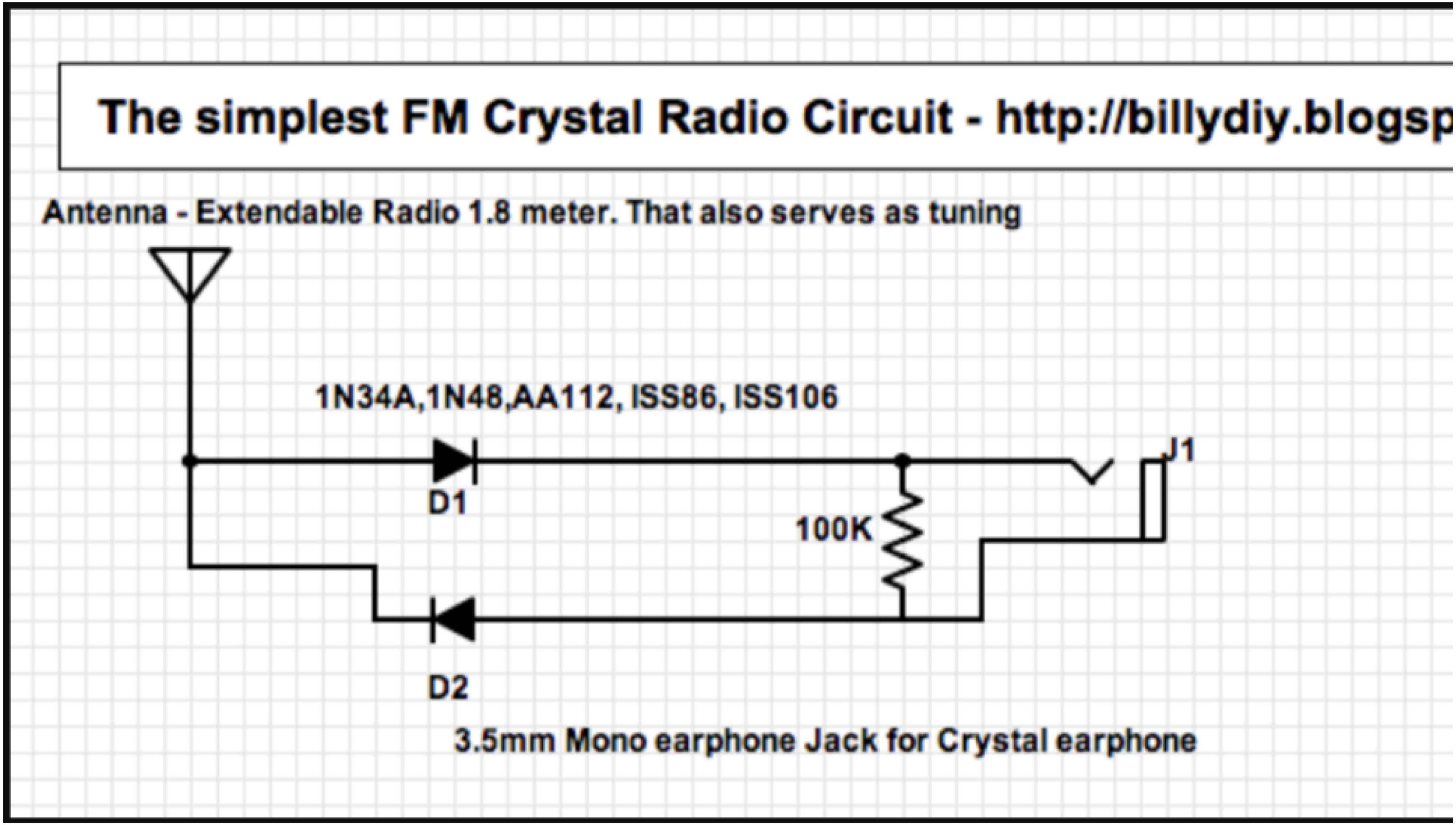
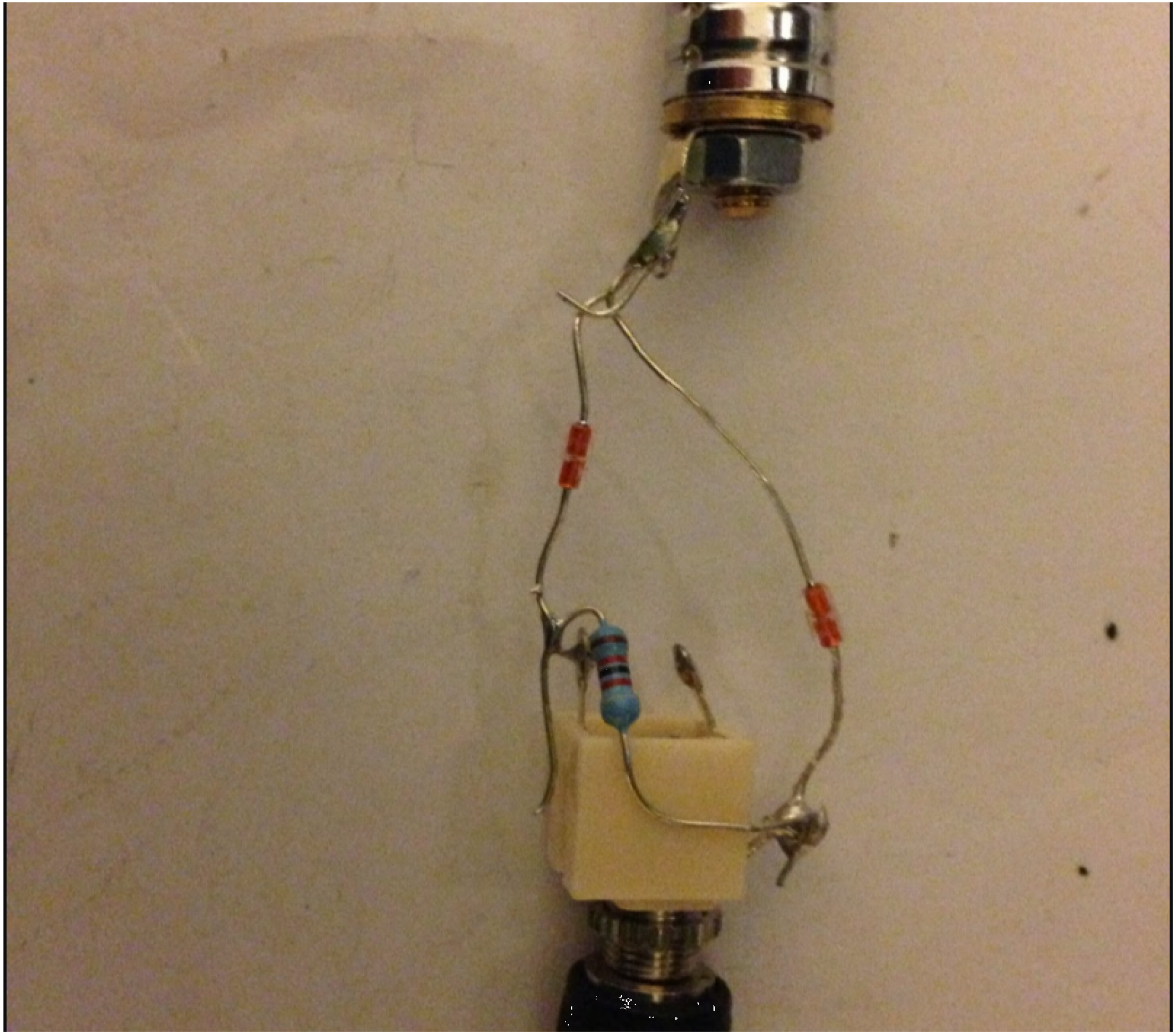


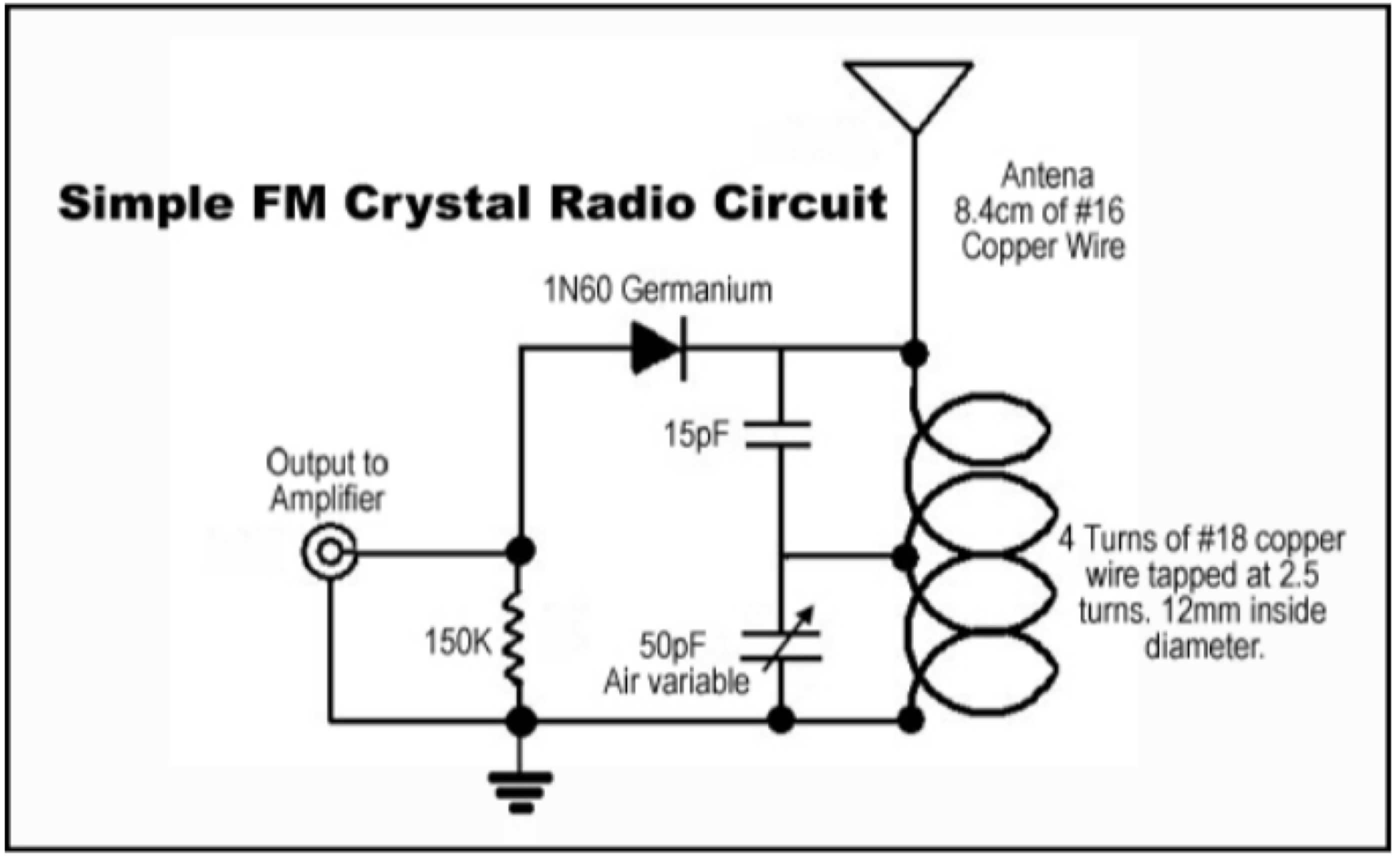
Figure 2 An electric field probe, and a pin probe




The simplest FM Crystal Radio Circuit - http://billydiy.blogsp
Antenna - Extendable Radio 1.8 meter. That also serves as tuning
1N34A,1N48,AA112, ISS86, ISS106
J1
D1
100K
D2
3.5mm Mono earphone Jack for Crystal earphone



FM Crystal Radio Circuit

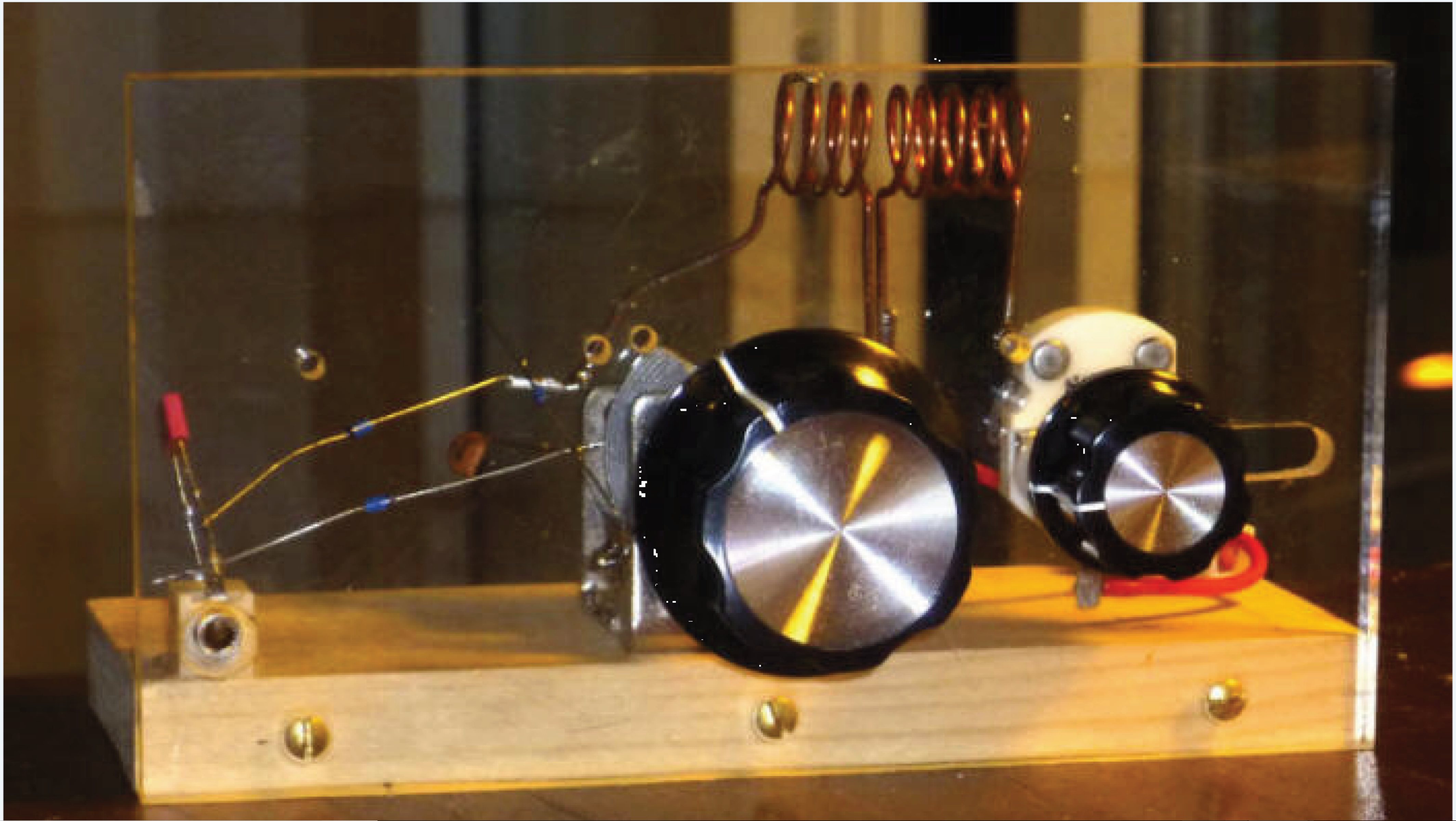


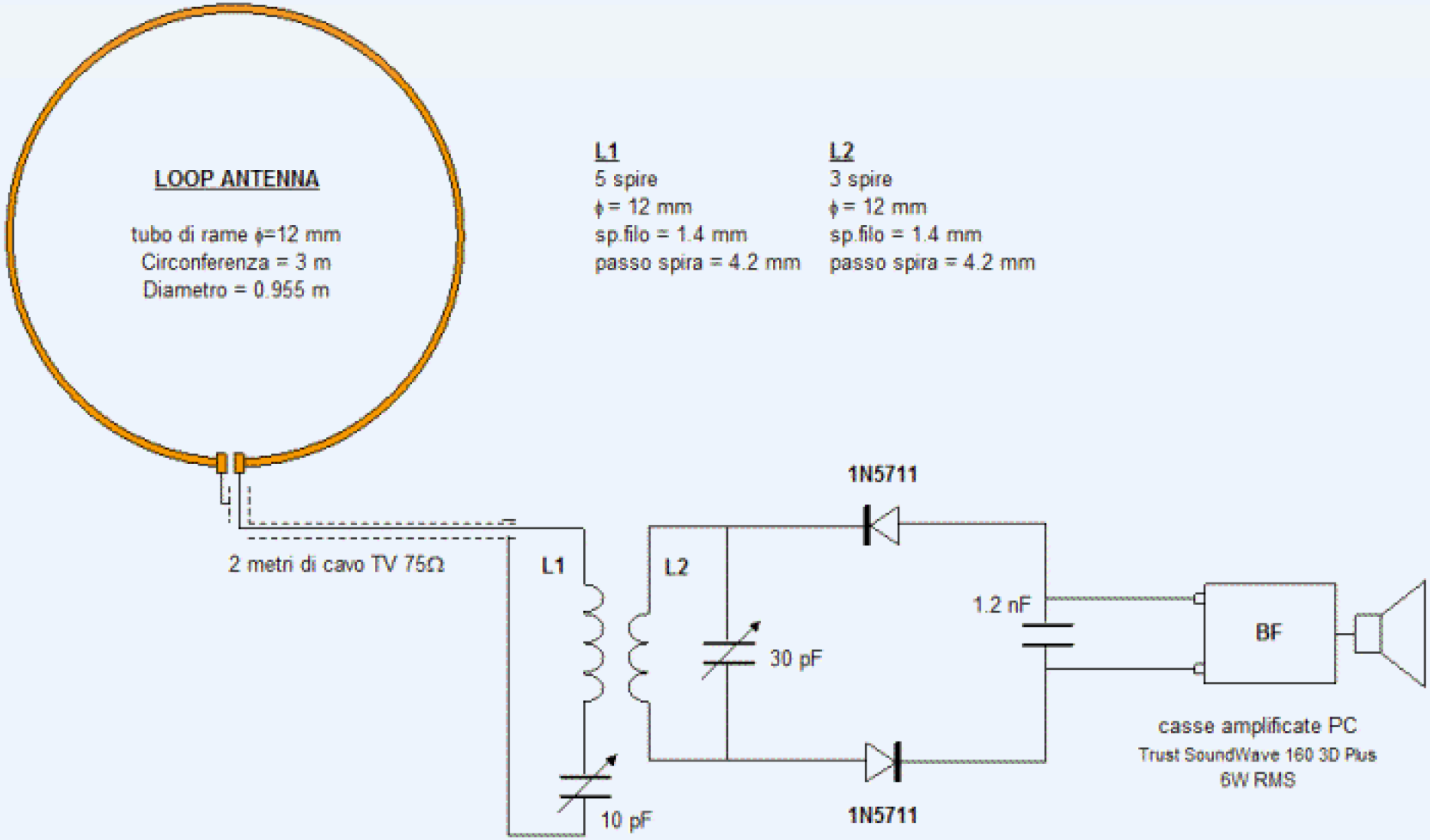
Parts List (some of these parts you can buy from our online store):

- 1N60 Germanium Diode
- 15pF Ceramic Capacitor
- 50pF Variable Capacitor
- 150K Ohm Resistor
- #16 & #18 Copper wires

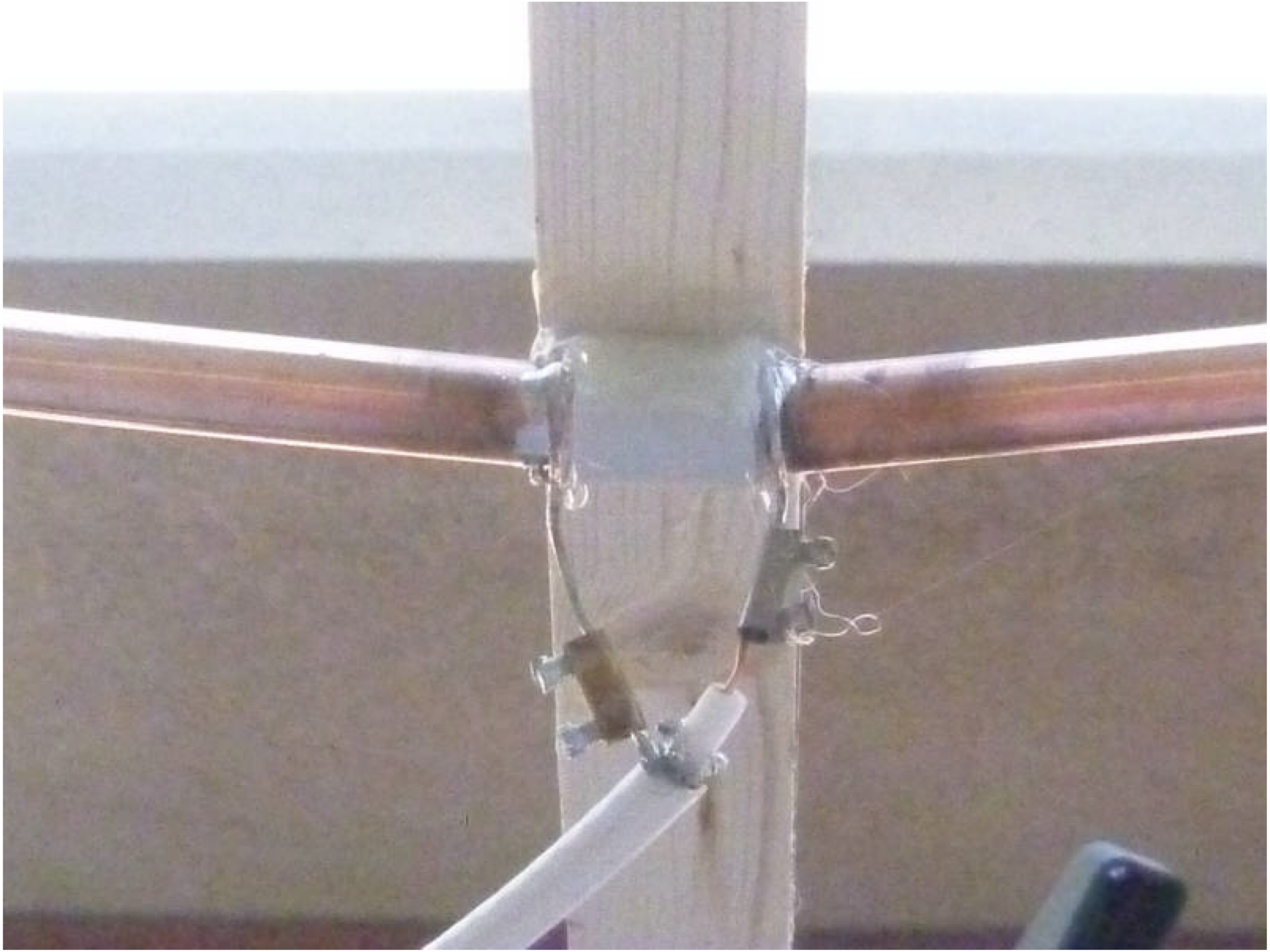
Ricevitore a cristallo per FM

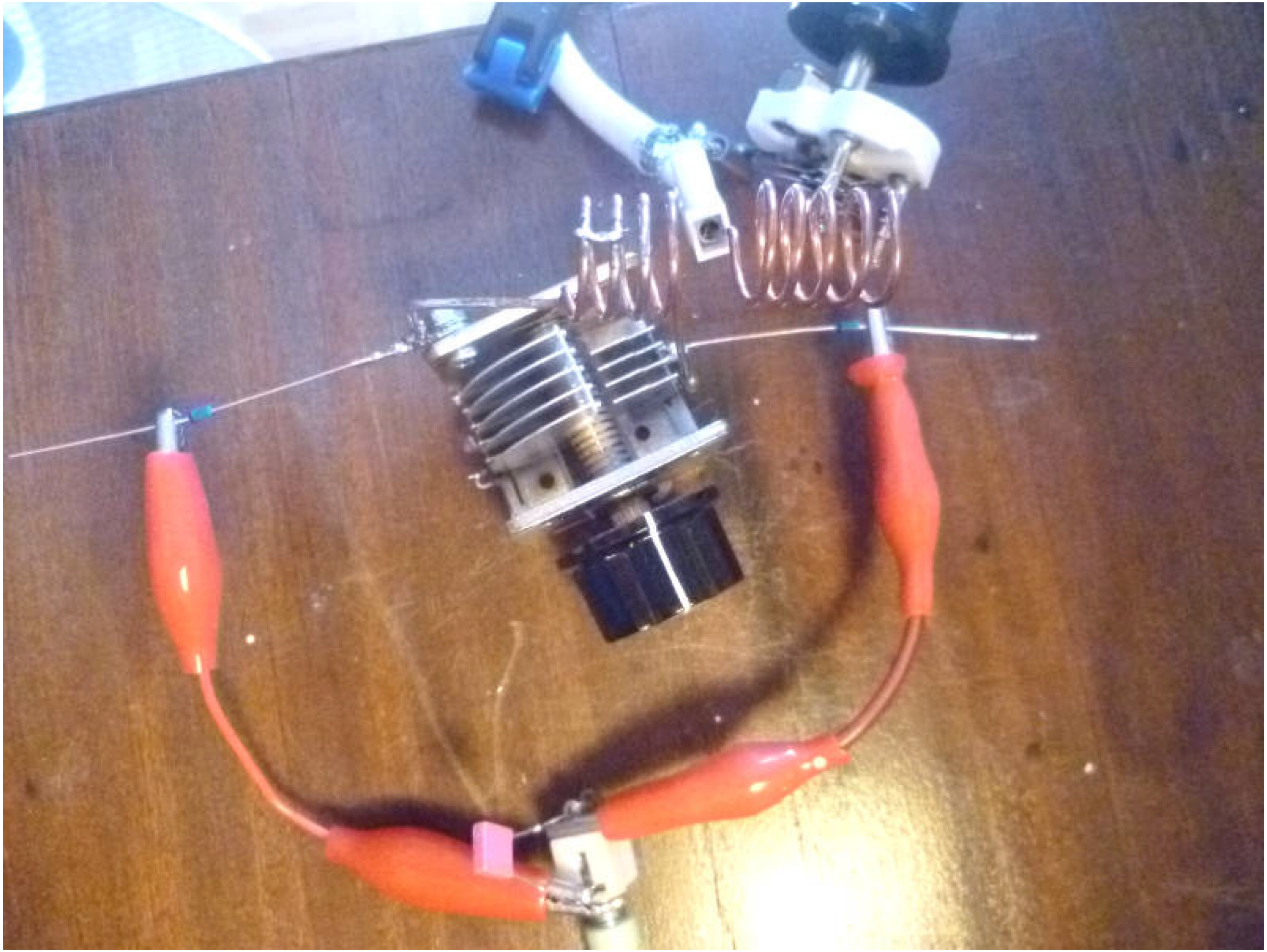
Un progetto di Giacomo Cavuoti

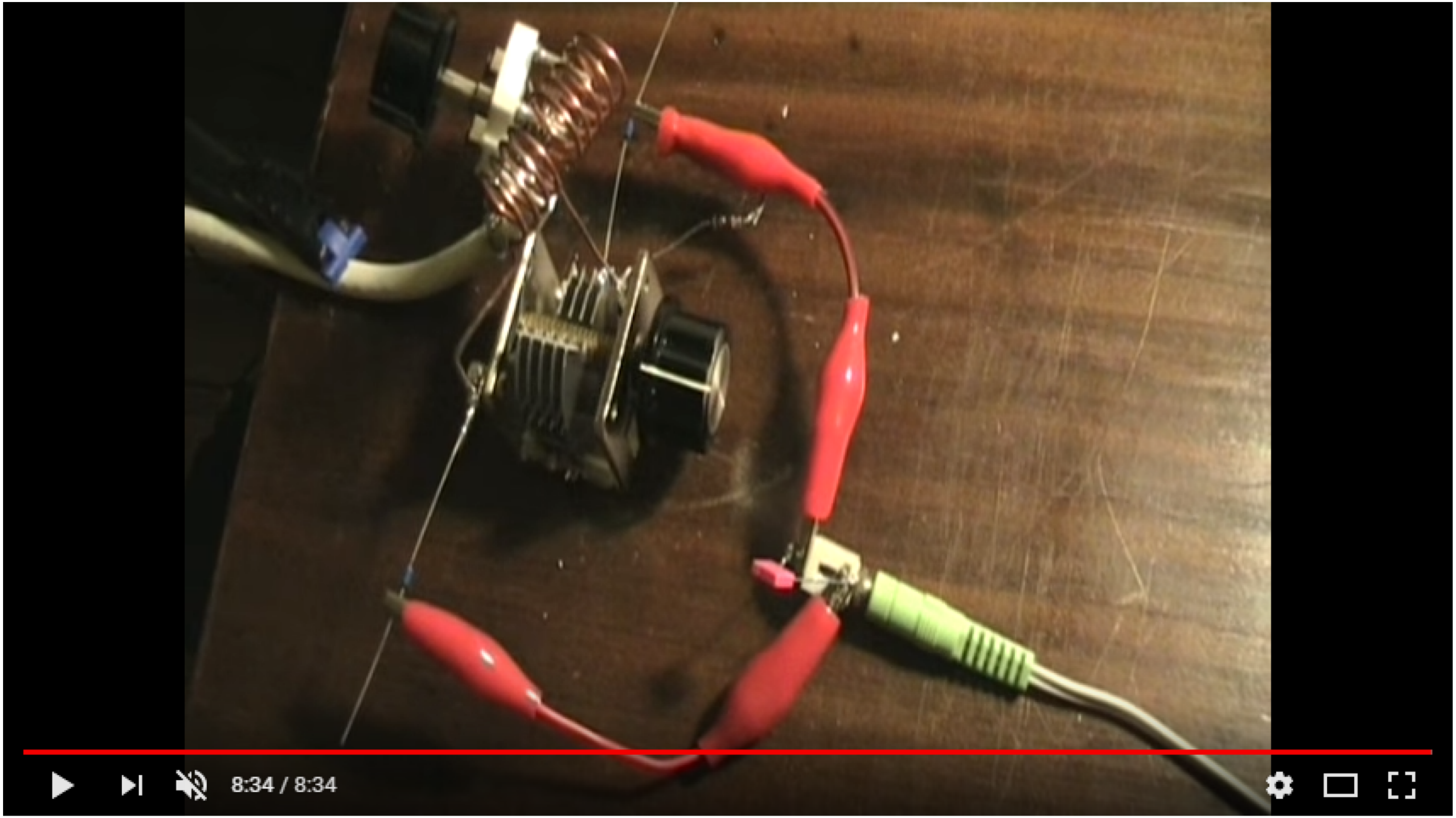




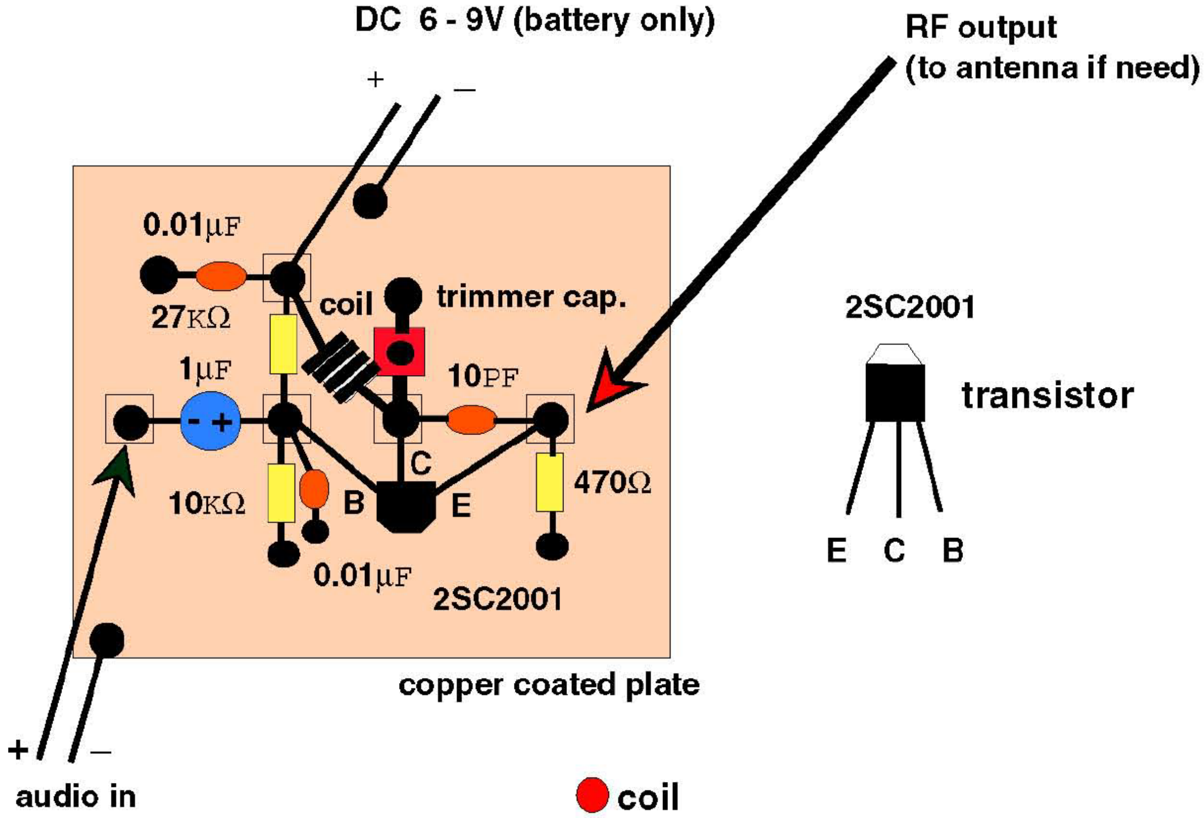
The receiver is "powered" by a full wave loop antenna consisting of a single circular coil made of 3 meters of copper pipe for hydraulic systems (measured inductance of about 3 uH). The support is a simple 2-meter long fir-wood strip, 3 cm wide and 1 cm thick, to which the copper rim has been fixed with insulating tape. Another solution to realize the loop antenna in a simple and instantaneous way is to use an aluminum strip 2 mm thick and 2 cm wide. The detectors are two *Schottky* diodes type 1N5711, particularly suitable for VHF thanks to the low capacity (about 2pF). They are currently in production and therefore easy to find. The receiver was tested in a "stiff" situation with the antenna exposed in a recessed balcony (3 x 1.6 meters) on the fourth floor of a 6-storey reinforced concrete building surrounded by other buildings constructed of reinforced concrete walls. As you can see and hear from the two videos I uploaded on Youtube:






8:34 / 8:34

Making the simplest Transmitter



soldered point:

: direct to the ground

: insulated from the ground

coil

3 - 4 turns by coated 0.8 mm wire

 5 - 7mm 

registers

470 Ω *(yellow-violet-brown)*

10K Ω *(brown-black-orange)*

27K Ω *(red-violet-orange)*

capacitors

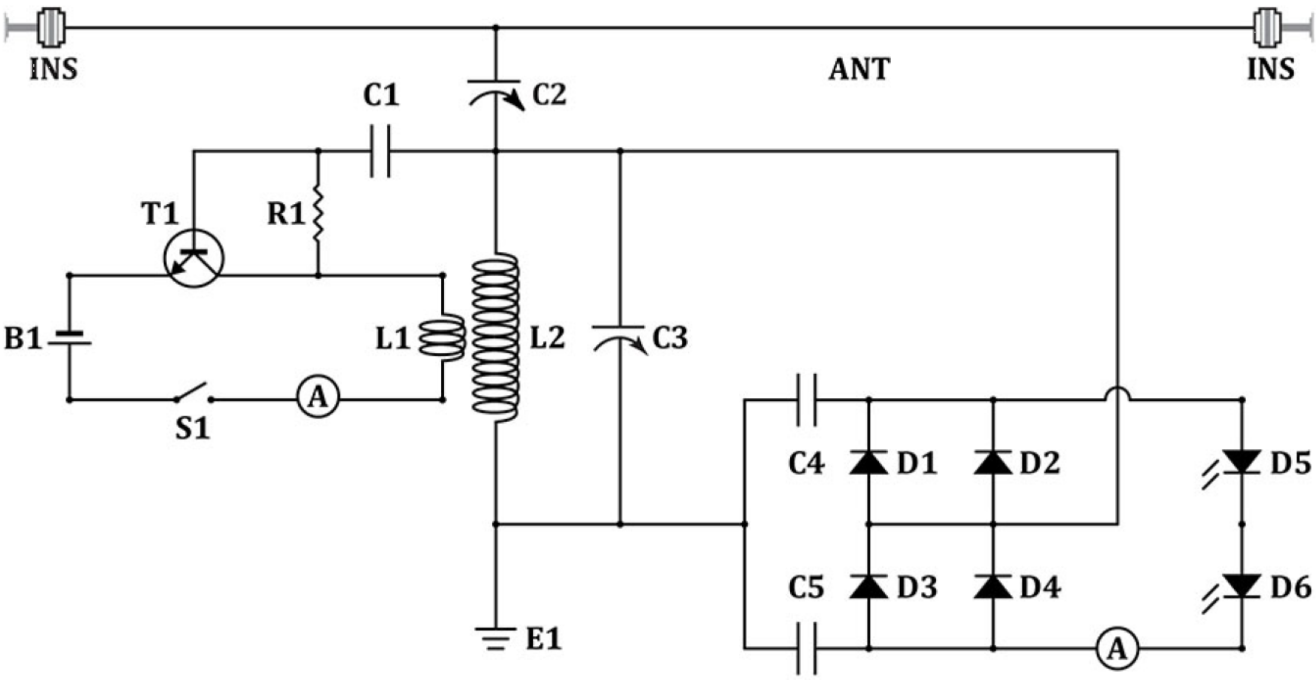
10 PF

0.01 µF *(103)*

1 µF

trimmer capasitor 20PF

Radiant Energy Proof of Concept Receiver Schematic – v2.6

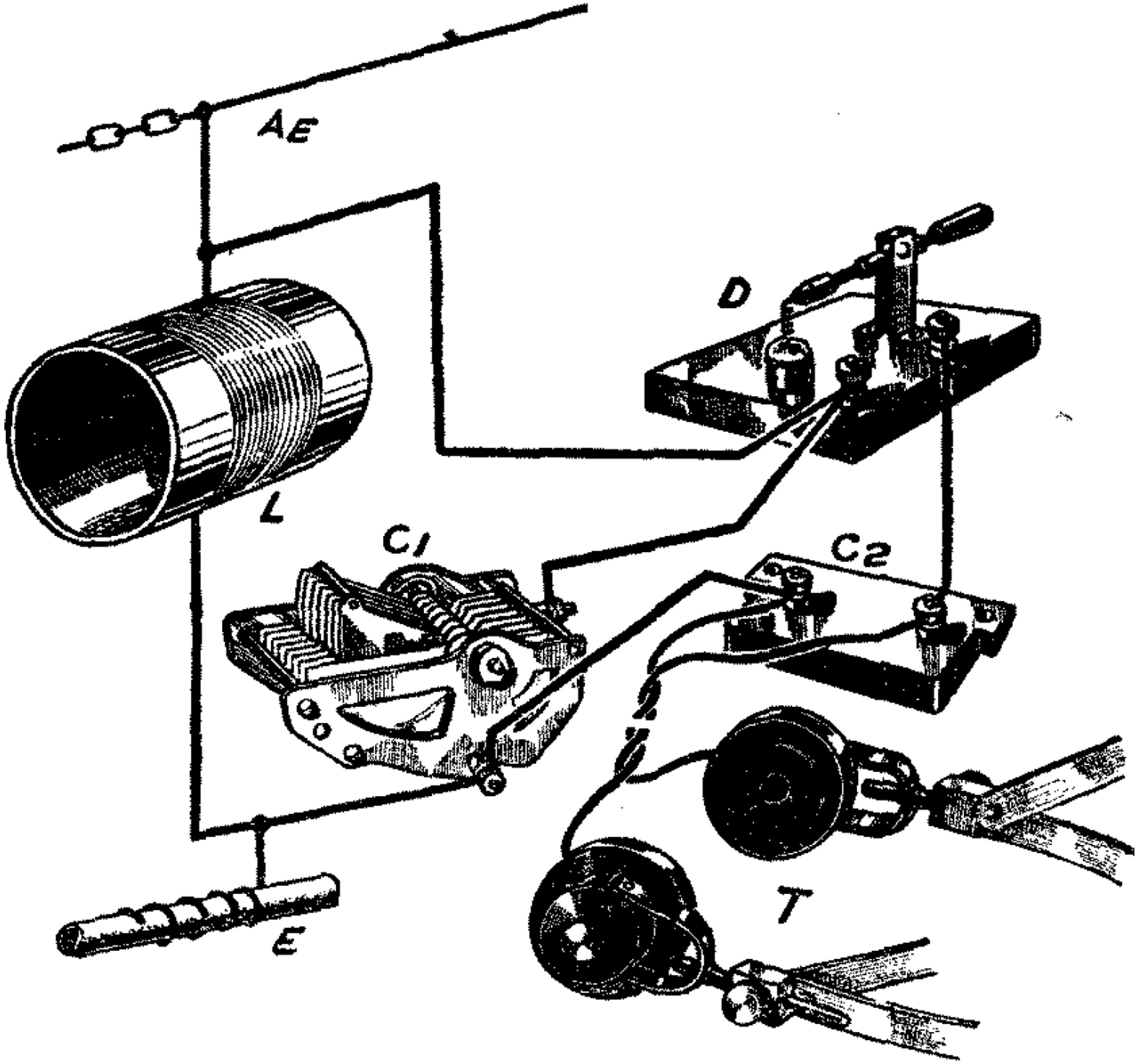


Key

A: Analogue mA ammeter.
ANT: Antenna 65' long, 6ga, V shape, electrically isolated at least 10' from the ground.
B1: 6 volt SLA rechargeable battery.
C1: 560pf, 50v ceramic capacitor.
C2, C3: 365pf variable air capacitors, less than 1kv.
C4, C5: 450 volt, 47µF electrolytic capacitors.
D1-D4: UF4007 1.0a ultra fast recovery diodes.
D5, D6: 2 - 3.7 volt, 30ma, 10mm ultrabright LEDs.
E1: Earth grounding rod.
INS: Electrically non conductive insulators.
L1: 3 turns, 18ga wire wound over L2 windings.
L2: 50 turns, 20ga enameled wire wound on a 3" diameter cardboard tube.
R1: 10k, 1/4 watt resistor.
S1: On/Off switch.
T1: MJE13007 transitor.

Input: 6 volts @ 7.5 mA.
Output: 6 volts @ 38 mA.
Gain: 30.5mA = over five times more output than input.

turning low-frequency currents into sound, and it would be as



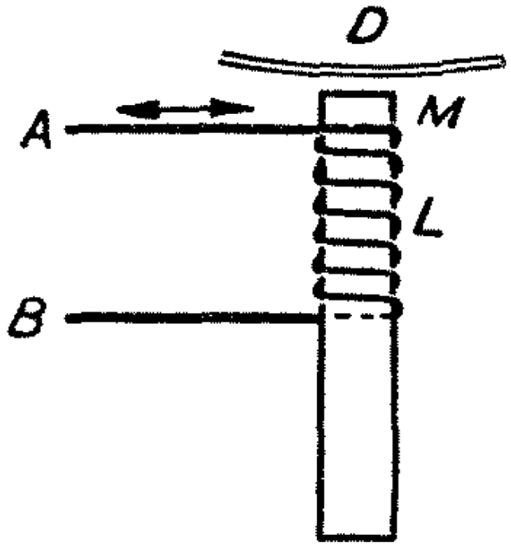


Fig. 17—Currents vary the strength of the magnetism and so cause diaphragm movements

Fig. 16 (b)—Pictorial representation of the simple

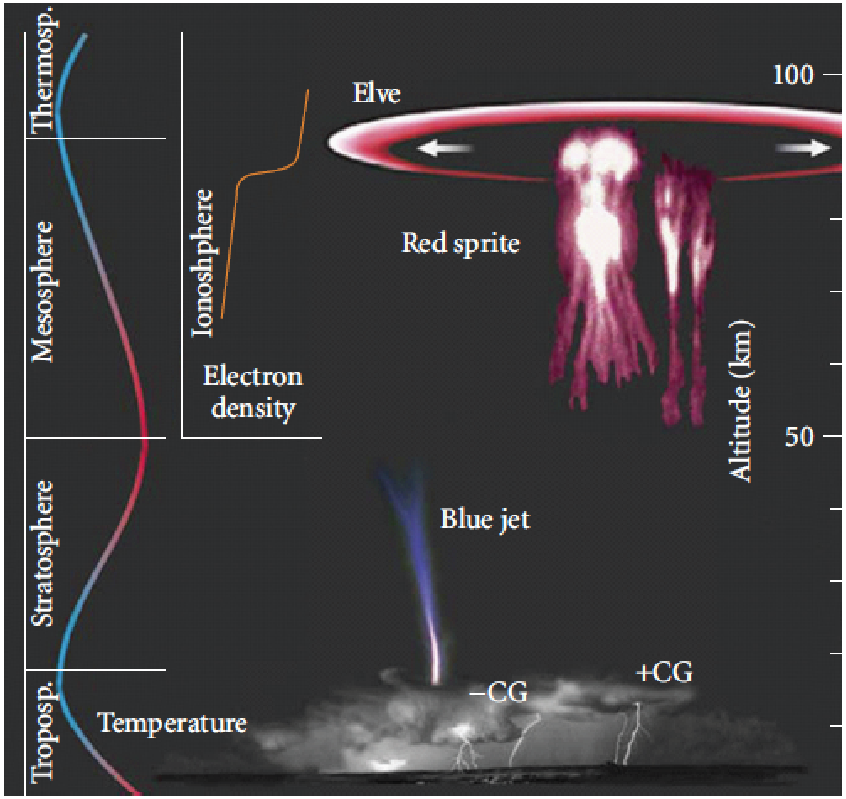


FIGURE 2: Depiction of various optical events in the atmosphere and the altitude at which they occur, credit [2].

or at time as low as the cloud top and bright region is in the altitude range 65–85 km [35]. They typically last for 5–50 ms and may take the form of one or more vertical columns of a few hundred meter radius for the smaller column sprites or large jellyfish-shaped structures of tens of kilometers of radius and extending from the ionosphere D-region almost down to the thunderstorm cloud tops [2, 35]. The knowledge gained from laboratory experiment of gas discharges at subatmospheric pressure has been used to understand sprite spectroscopy and associated phenomena [25]. Figure 3 shows broad identical spectral characteristics of light of positive column of the laboratory tube and sprites [25]. The difference in spectral characteristics may be due to difference in applied electric field, gas pressure, and gas composition in the mesosphere and gas tube discharges. Physical processes associated with sprites and other optical events are also associated with thunderstorm activity in the troposphere and are thought to result in the gradual build-up of conductivity changes in the lower ionosphere [36]. Liszka [37] suggested the generation of infrasound waves by sprites, whose signatures were detected by a network sensors in Sweden [38]. The shape of the chirp signature in the spectrograms of infrasound can be explained by the horizontal size of the sprite [39]. Neubert et al. [40] have

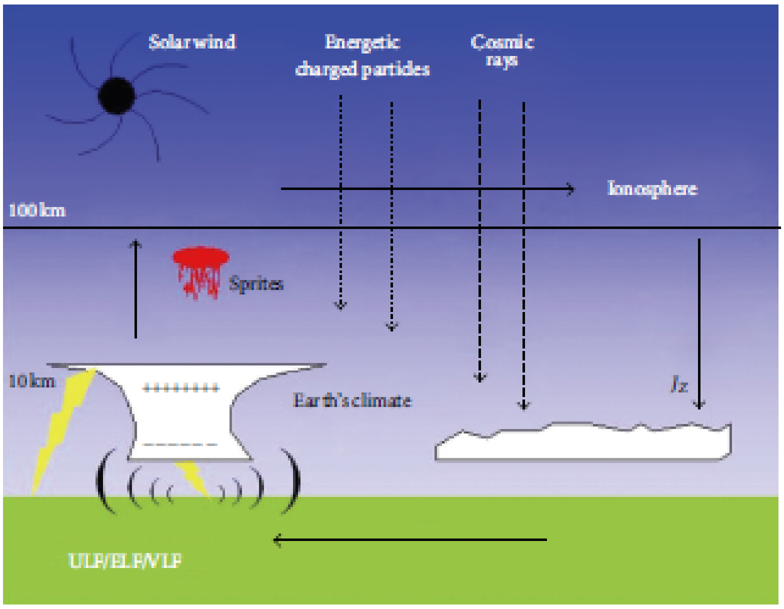


FIGURE 4: Essential features of the global atmospheric electric circuit [26, 27].

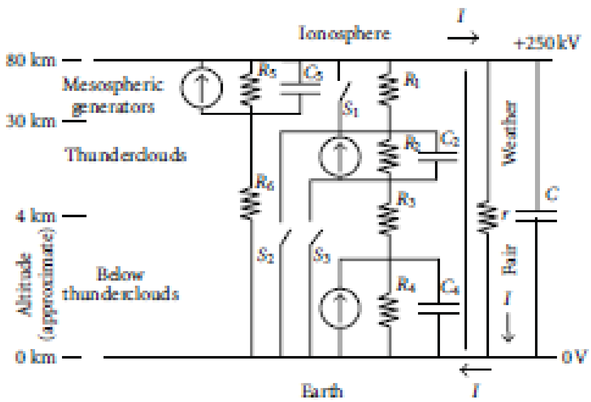


FIGURE 5: Diagram showing a schematic equivalent circuit for global electric circuits, credit [28].

system, that electric currents redistribute charge and that the electric currents are continuous.

The power supplied by thunderstorms is insufficient to maintain a field of magnitude observed in fair-weather regions. Rycroft et al. [61] included the generator associated with electrified clouds in the GEC model; this was found to be of the same magnitude as that due to thunderstorms. The optical phenomena occurring in the upward branch of the GEC above the thunderstorms are likely to influence only the upper atmosphere conductivity. Since they occur much less frequently (only one sprite out of 200 lightning) because of their association with intense lightning discharges [50, 62], their contribution to the ionospheric potential is very small [61]. The gigantic jets transport large quantities of negative charge discharging the atmospheric capacitor [63–66] whose effects on the ionosphere and GEC have not yet been modeled. The role of sprite/TLE events on the flow, charging/discharging of GEC, modification of electric fields near the Earth's surface remains unanswered. Since optical emissions could change electrical properties of the atmosphere and influence processes related with weather and climate, intense research activity in this area is required.

The earthquakes affect the electrodynamics of the atmosphere through the generation of electric and magnetic fields with crustal deformation, fault-failure-related piezomagnetism, stress/conductivity, electrokinetic effects, charge generation processes, thermal remagnetization, and demagnetization effects, and so forth [67]. These processes in the Earth's lithosphere relate with disturbances in the atmosphere and ionosphere. Sorokin et al. [8] discussed the processes forming the electrodynamic model of the effect of seismic and meteorological phenomena on the ionosphere. Radioactive substances and charged aerosols injected into the atmosphere modify the altitude profile of conductivity, generation of external currents, perturbation of electric field, and current in the ionospheric layer. As a result, Joule heating of the ionosphere and instability of acoustic gravity waves take place, which manifests in the formation of horizontal inhomogeneities of ionospheric conductivity. Finally, excitation of plasma density fluctuations and ULF/ELF emissions in the ionosphere, generation of field aligned currents and plasma layers, upward plasma transport, and modification of F_2-layer, and change in the ion composition of the upper ionosphere take place [68, 69]. These changes may also affect the GEC and the Earth's climate which remains a challenging problem to be solved. Figure 6 shows a schematic diagram which can be used to

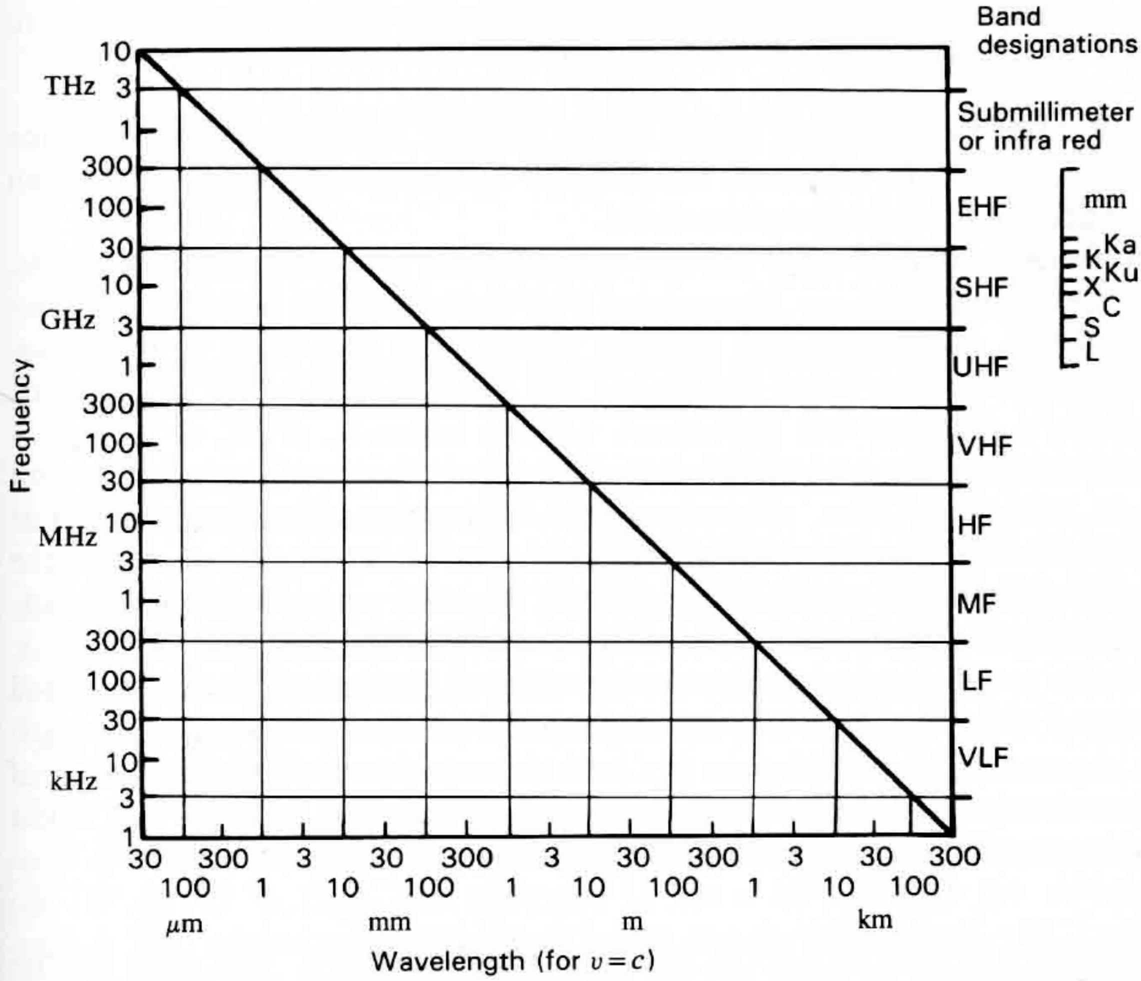


Figure 1-7 Wavelength versus frequency for $v = c$.

Example of wavelength for a given frequency. For a frequency of 300 MHz the corresponding wavelength is given by

$$\lambda = \frac{c}{f} = \frac{3 \times 10^8 \text{ m s}^{-1}}{300 \times 10^6 \text{ Hz}} = 1 \text{ m} \tag{3}$$

In a lossless nonmagnetic dielectric medium with relative permittivity $\varepsilon_r = 2$, the same wave has a velocity

$$v = \frac{c}{\sqrt{\varepsilon_r}} = \frac{3 \times 10^8}{\sqrt{2}} = 2.12 \times 10^8 \text{ m s}^{-1} \tag{4}$$

and

$$\lambda = \frac{v}{f} = \frac{2.12 \times 10^8}{300 \times 10^6} = 0.707 \text{ m} = 707 \text{ mm} \tag{5}$$

1-4 DIMENSIONS AND UNITS.

Lord Kelvin is reported to have said:

When you can measure what you are speaking about and express it in numbers you know something about it; but when you cannot measure it, when you cannot express it in numbers your knowledge is of a meagre and unsatisfactory kind; it may

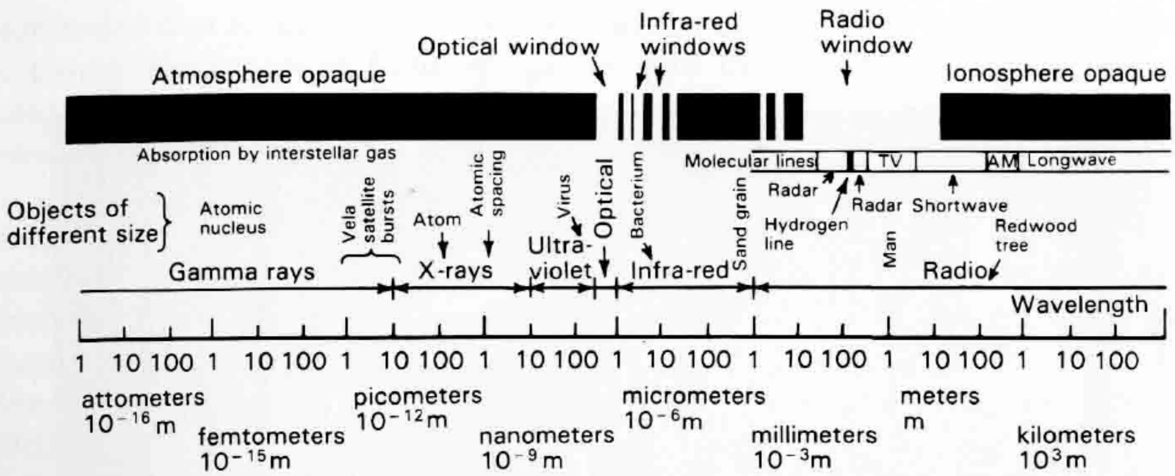


Figure 1-6 The electromagnetic spectrum with wavelength on a logarithmic scale from the shortest gamma rays to the longest radio waves. The atmospheric-ionospheric opacity is shown at the top with the optical and radio windows in evidence.

Thus, the wavelength depends on the velocity v which depends on the medium. In this sense, frequency is a more fundamental quantity since it is independent of the medium. When the medium is free space (vacuum)

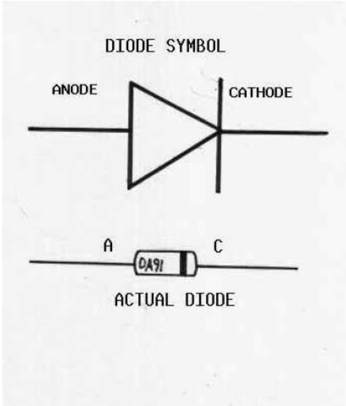
$$v = c = 3 \times 10^8 \text{ m s}^{-1} \tag{2}$$

Figure 1-7 shows the relation of wavelength to frequency for $v = c$ (free space). Many of the uses of the spectrum are indicated along the right-hand edge of the figure. A more detailed frequency use listing is given in Table 1-1.

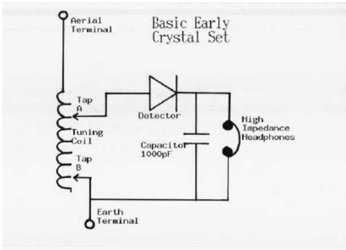
Table 1-1 Radio-frequency band designations

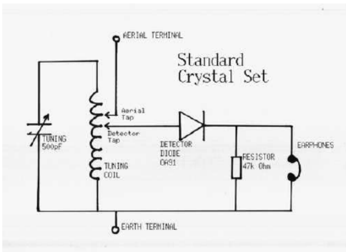
Frequency	Wavelength	Band designation
30–300 Hz	10–1 Mm	ELF (extremely low frequency)
300–3000 Hz	1 Mm–100 km	
3–30 kHz	100–10 km	VLF (very low frequency)
30–300 kHz	10–1 km	LF (low frequency)
300–3000 kHz	1 km–100 m	MF (medium frequency)
3–30 MHz	100–10 m	HF (high frequency)
30–300 MHz	10–1 m	VHF (very high frequency)
300–3000 MHz	1 m–10 cm	UHF (ultra high frequency)
3–30 GHz	10–1 cm	SHF (super high frequency)
30–300 GHz	1 cm–1 mm	EHF (extremely high frequency)
300–3000 GHz	1 mm–100 μm	
Frequency	**Wavelength**	**IEEE Radar Band designation**
1–2 GHz	30–15 cm	L
2–4 GHz	15–7.5 cm	S
4–8 GHz	7.5–3.75 cm	C
8–12 GHz	3.75–2.50 cm	X
12–18 GHz	2.50–1.67 cm	Ku
18–27 GHz	1.67–1.11 cm	K
27–40 GHz	1.11 cm–7.5 mm	Ka
40–300 GHz	7.5–1.0 mm	mm

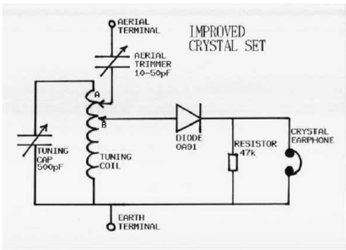
easily by having many different tapping points on the coil so that adjustments can be made.



An illustration of a modern diode which is often encapsulated in glass and is about 7mm long. Above is the electronic symbol for a diode.







To make tuning easier a component called a tuning capacitor can be included in the circuit. In very early sets a tuning capacitor was not always included to keep costs down, or due to their being difficult to obtain.

The Detector converts the radio wave received into an electrical wave that is suitable for the headphones to, in turn, convert into sound waves that can be heard by the human ear. In the very early days of the crystal set the detector consisted of a holder containing a piece of galena crystal that had a very thin and springy wire placed on its surface that had to be very delicately adjusted to find the sweet spot where the radio station could be heard. This was commonly referred to as a "Cat's Whisker". Modern detectors are called diodes and are more efficient than early detectors and cats whiskers. Diodes are still quite readily available and inexpensive. Part numbers for modern diodes include OA90, OA91 and IN34. Diode part numbers that are perhaps now more difficult to obtain include OA47 and OA81.

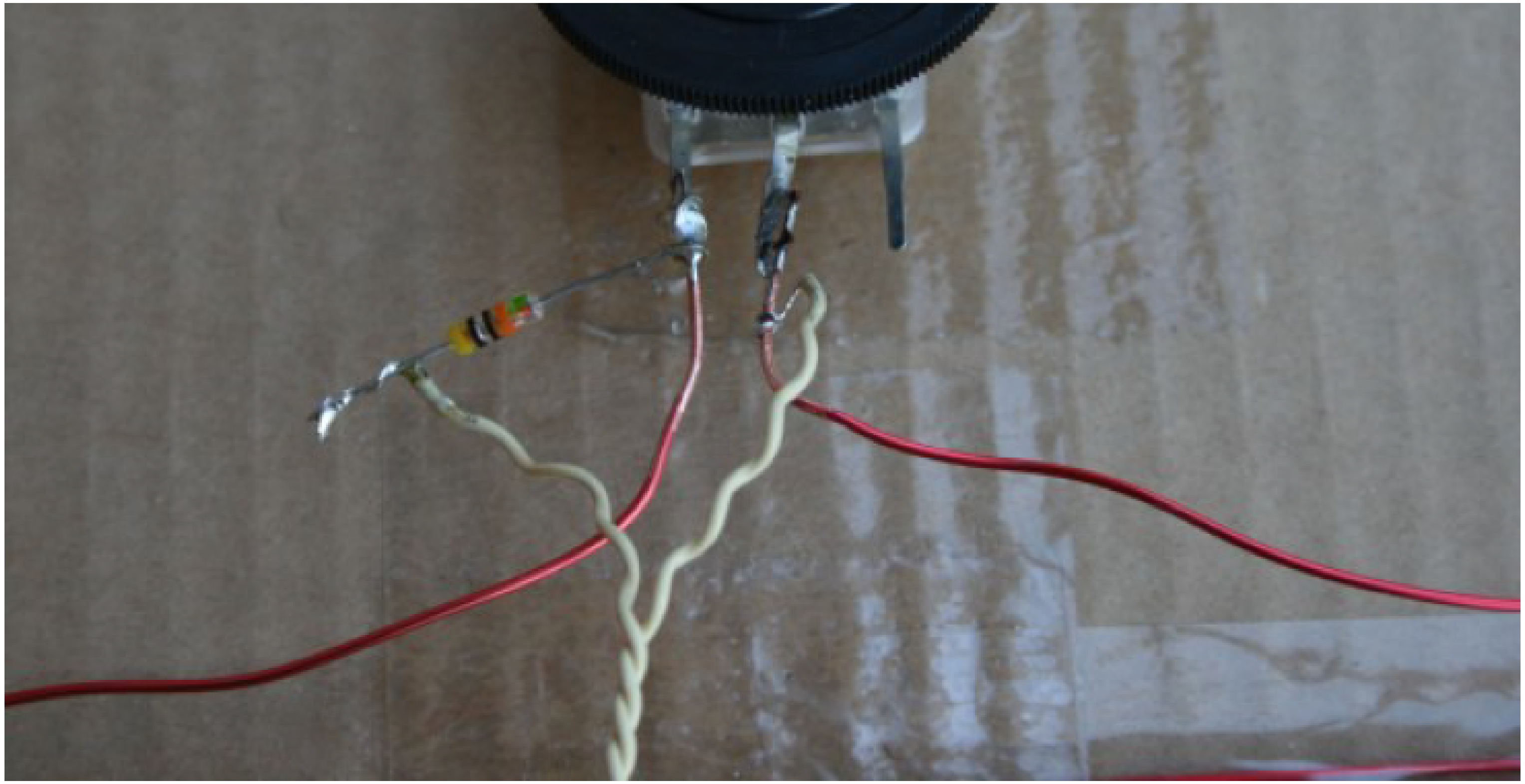
The headphones have to be of a very special type called high impedance headphones. Because there is no additional power source in a crystal set the current generated in the circuit is tiny - minuscule in fact. Ordinary low impedance headphones, such as Walkman headphones, would present a virtual short circuit to the crystal set allowing the tiny signals to drain away to earth & consequently producing no sound - not very useful!

High impedance headphones, on the other hand, reduce or impede the flow of current down to earth, in effect saving the tiny signals to produce sounds from the headphones that we can then hear.

There is a problem however, these high impedance headphones that were so readily available in the 1920's and 1930's are to so easy to obtain today, but some specialist vintage radio outlets still stock them though the price can be quite high. They can still be seen in museums of course. All is not lost though, today we can obtain a special earphone called, appropriately, a crystal earpiece very easily and far more cheaply than. An electronic component, called a resistor, must be connected accross the crystal earphone to allow a path for DC current to get to earth. The value of the resistor is usually 47,000 Ohms and without it a crystal earphone tends to block DC current and as a consequence the sound will be very quiet and distorted.

Aerial and Earth: For a crystal set work it needs an efficient aerial and earth. Since a crystal radio has no power - no batteries or mains electricity - it relies entirely on the radio wave energy sent out from the radio station's transmitter and collected by the aerial to work. The aerial simply consists of a length of wire, but it necessarily has to be quite long, usually in the order of 10 to 20 meters. For the aerial to be effective the crystal radio set also has to be connected to a good earth point. A good earth often consists of a 3 or 4 foot copper stake driven into the ground, but sometimes a water pipe can be used to reasonable effect. (Safety: Never use the earth pin of a household mains plug)

The circuit diagram (schematic) for a crystal set is shown below. Practical designs are shown on the following pages.



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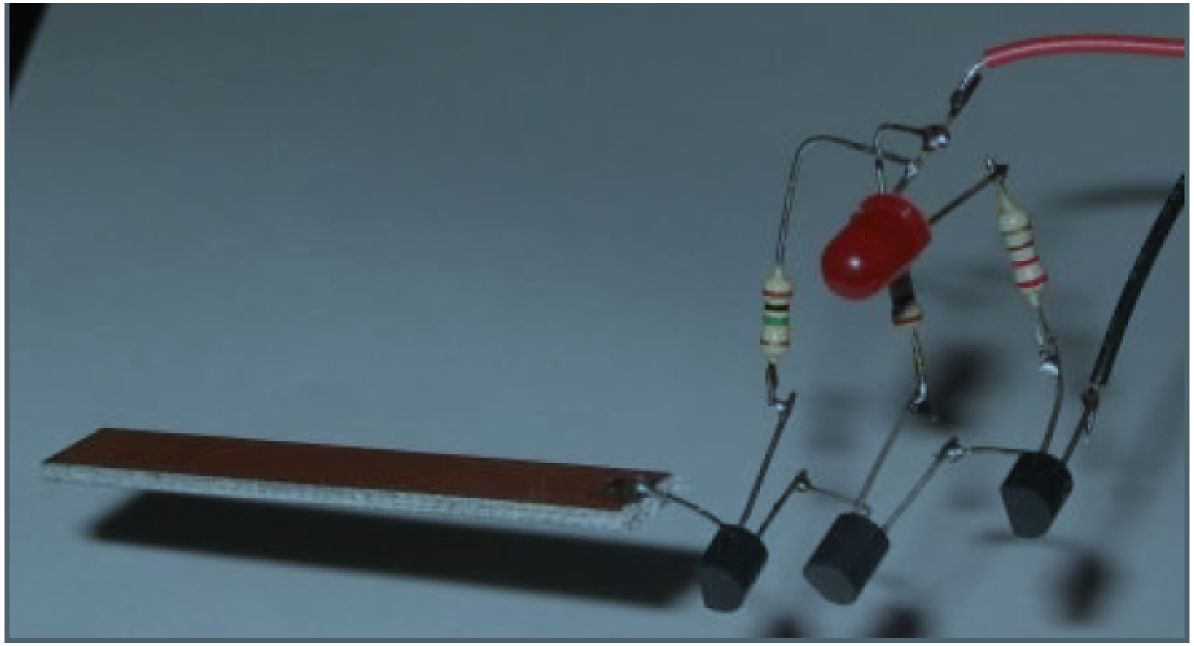
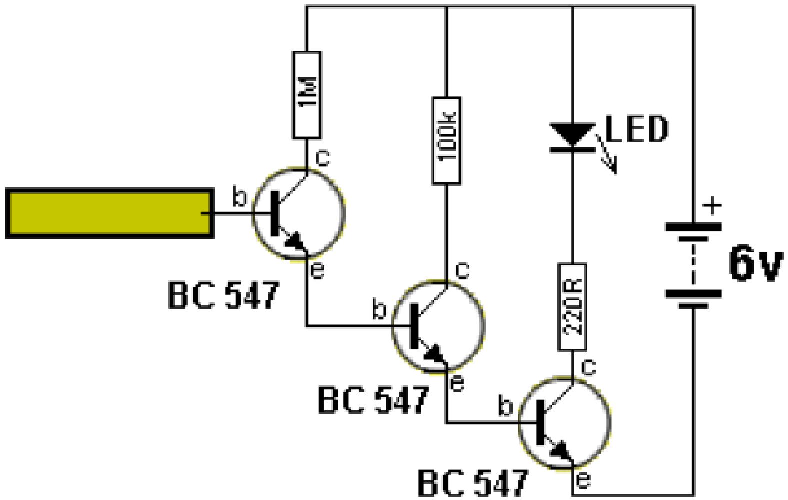


8 MILLION GAIN!

This circuit is so sensitive it will detect "mains hum." Simply move it across any wall and it will detect where the mains cable is located. It has a gain of about 200 x 200 x 200 = 8,000,000 and will also detect static electricity and the presence of your hand without any direct contact. You will be amazed what it detects! There is static electricity EVERYWHERE! The input of this circuit is classified as very high impedance.



Here is a photo of the circuit, produced by a constructor, where he claimed he detected "ghosts."

[Return to VK3YE amateur radio projects]

A simple crystal set for free power radio

Of any electronic project, the crystal set would have to rate as one of the most popular. Many amateurs are on the air today because of their early construction of a crystal set. Most practical electronic books for beginners include at least one crystal set project. Unfortunately, some of these circuits take simplicity too far and deliver mediocre performance, often by omitting key components such as the tuning capacitor, or failing to provide coil taps.

This article describes a crystal set of medium complexity. It features coil taps for the antenna and diode to make it useful for both country and metropolitan listeners. The taps allow the set to cover 160 metres if desired. All parts are easily obtainable, making it a good choice for the beginner. The endless possibilities for experimentation also make crystal sets interesting novelty projects for experienced constructors. The schematic is shown here:

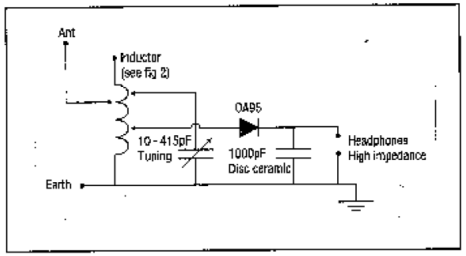


Figure One: Schematic diagram of crystal set

VK3YE Crystal Set

Schematic & Layout diagrams

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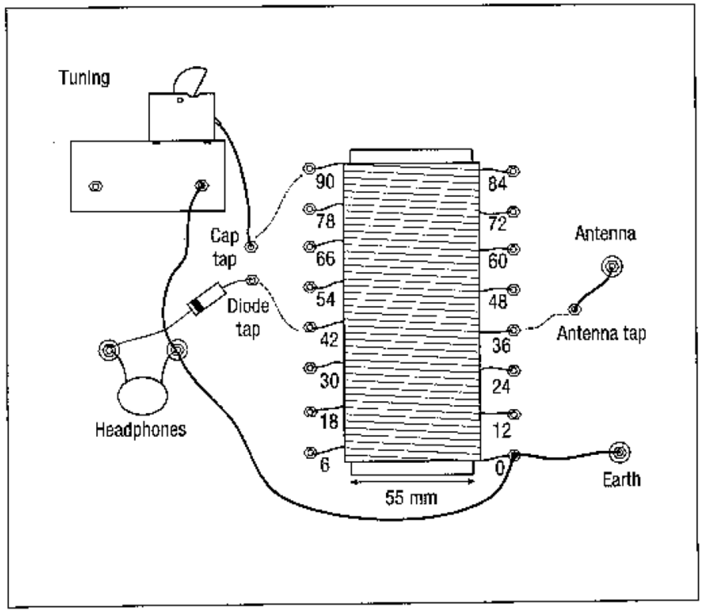

Figure Two: Rear view of front panel, showing coil details

(from Amateur Radio February 2001, page 20)

Obtaining the parts

Tuning capacitor